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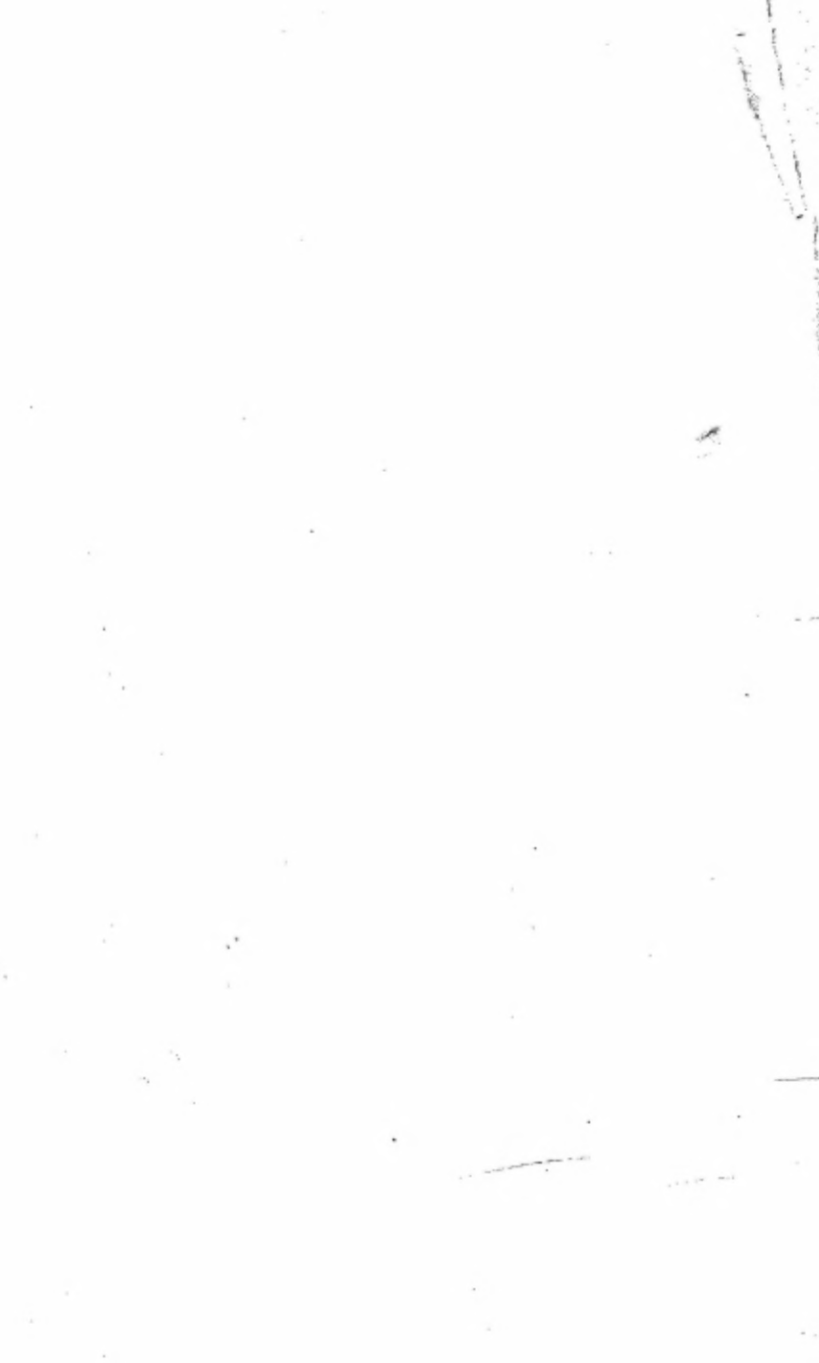
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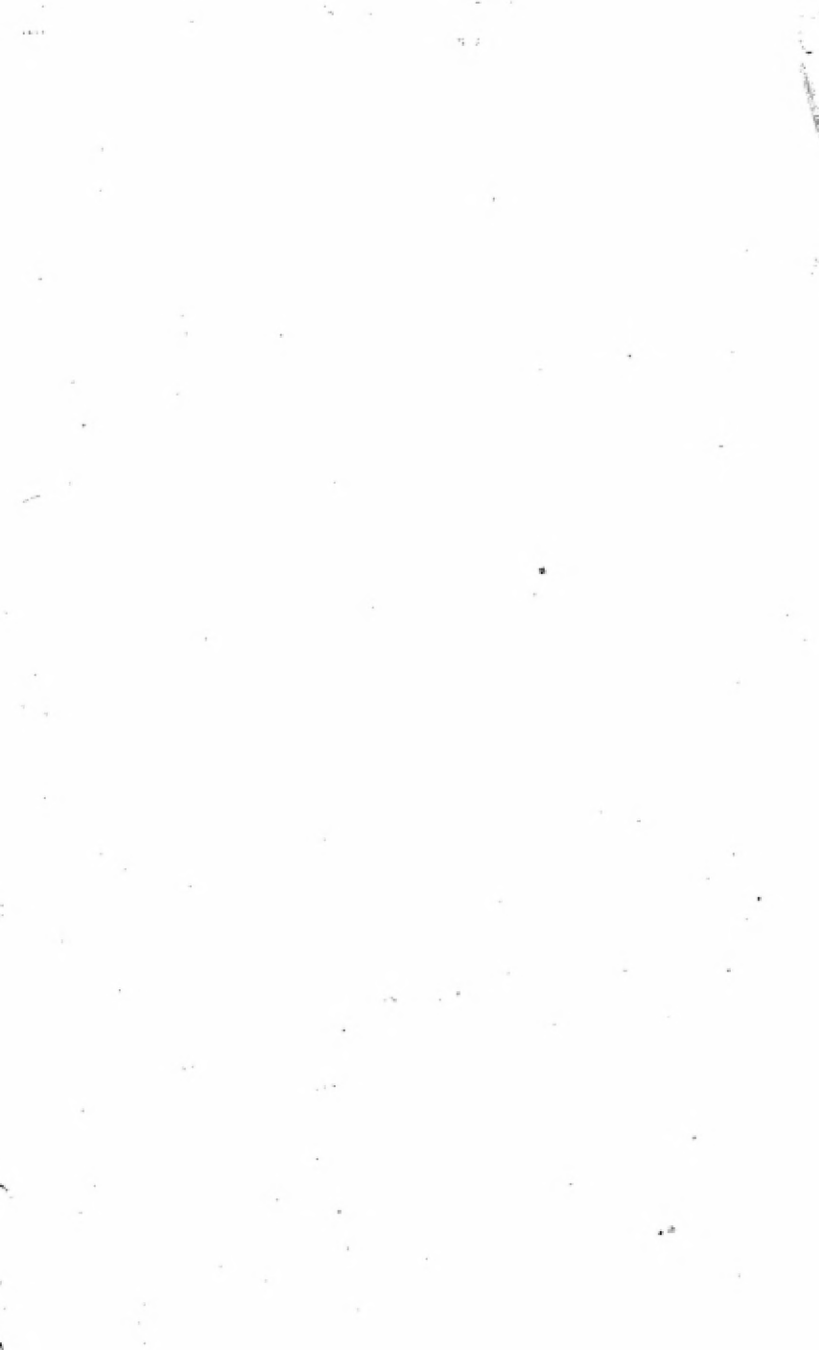
PRECIOUS STONES

AND

PRECIOUS METALS.

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THE NATURAL HISTORY

OF

PRECIOUS STONES

AND OF THE

PRECIOUS METALS.

By C. W. KING, M.A.,

FELLOW OF TRINITY COLLEGE, CAMBRIDGE; AUTHOR OF 'ANTIQUE GEMS,' ETC.



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PREFACE.

THE high commendation lavished by all reviewers, both scientific and literary, upon the First Edition of this Treatise, and its rapid exhaustion by the reading public, have attested in the most gratifying manner the success of my attempt to present in a compendious form the archaeology, combined with the present history, of the things that in all ages have been accounted the truest representatives, or rather the actual constituents, of value, the most sought-after of all decorations for the person, the most multiplied as well as most enduring vehicles of the creative art of antiquity in all its phases, and therefore the most trustworthy (when they can be read) of all historical monuments—things too that before the decay of Faith marking these “latter days,” were ever regarded as the chosen dwelling-places of the astral influences, of those Virtues from on high whose working in them secured the blessing of heaven, the favour of man, for their fortunate possessors. The novelty of the undertaking—its thus combining in one the ancient, mediæval, and modern views of the “Science of Precious Stones”—was perhaps its foremost recommendation; its execution, however (for once less satisfactory to the author than to his readers), fell very short of my wishes, and of the idea before my mind in the first sketching out of my plan.

But now that a Second Edition is called for, the favourable appreciation of my former labours, with all their shortcomings, has, to my great satisfaction, encouraged the publishers to concede a somewhat more liberal allowance of space for the treatment of a subject that most literally

"Æstuat angusto conclusus limite"

of a single volume.

I have therefore once again gone with a will into the mines of antiquity to dig out fresh ore—no fear of exhausting the endless veins; have again wandered lovingly through the true Aladdin's Garden of Eastern literature, plucking its fruits, which be all manner of precious stones—no fear of thinning the teeming crop; or, to descend to prose, have carefully referred to my copious stock of notes and collectanea, and selected much therefrom that struck me as calculated to increase the interest and the utility of numerous portions of the work before me. To do this properly many of the sections had to be remodelled and entirely re-written: whilst other articles, altogether fresh, were considered, from their connexion with history or with art, of sufficient importance to claim admittance within my now extended limits. I am under no apprehension of incurring the charge of "book-making;" every *true* scholar, every mineralogist, will perceive, by casting a glance into the numerous fields I have in the treatment of my subject but slightly opened out, that the whole of my space might have been profitably devoted to the consideration of a single one of its articles, for example, the "*Argentum*," or the "*Adamas*." It has also appeared to me a more natural arrangement of my matter to class together with the Precious Metals those gems, including the Pearl, that more

especially arrogate to themselves the same title of honour, and, with the monuments of antiquity which combine them all, to let them occupy an entire volume. The other mineral productions whose highest value lies in their subservience to the inspirations of art, but whose estimation as jewels is entirely dependent upon the caprice of fashion, are now separated and passed in review under the generic appellation of "Gems." This distinction, it is true, is not perfectly expressive of their character, but comes the nearest to it of any the poverty of our language can supply. The French, of all others the neatest and the most exact for the definite expression of every idea, possesses in this case also the required distinction of "*Pierres Précieuses*" and "*Pierres Fines*." But in English "*Fine Stones*," though some mineralogists have attempted to naturalize it in this most desiderated sense, would convey a totally different idea to the majority of readers. And this division suggests to me the prefatory remark, true to the letter, novel as it will sound to many, that the student of antique Glyptics brings to the discussion of the latter portion of our subject an immense superiority over the actual trading jeweller of the present age in the extent and multifariousness of his experience. The latter, tied down by the actual close restrictions of the mode, has only to deal with the four or five species monopolising at present the title of "*Precious*," and to make himself acquainted with their characteristics alone: the dactyliologist, on the other hand, has perpetually to examine, and to discriminate between, the varied productions of ancient India—productions held of old in almost equal estimation with the first class, as in truth they well deserved from the recommenda-

tion of their beauty, and their facile subservience to the most elegant of arts. He has constantly occasion to admire that Proteus of the gem family—the Indian Garnet—in all its changeful shapes of Almandine, Cinnamon-stone, Guarnaccino, and Pyrope: the transparent Calcedony in its emerald, purple, sanguine, and sapphirine disguises; the splendid dyes of the Arabian Jasper; and last, not least, the Agate, in its normal variegation, or regularly stratified and taking the name of the Onyx and Sardonyx. The jeweller of to-day can discern no difference between the vile German silex artificially stained with gaudy meretricious hues, and the precious Indian export of “the land of Havilah;” the student of antique art is enabled at once to detect and to appreciate the distinction.

It is gratifying to me to find that the highest scientific authority has sanctioned several of my attempts at identifying the present representatives of antique names, so strangely bandied about and misappropriated during the long night of the Middle Ages (which formed one of the chief features of my scheme); for example, in my tracing the different species of Pliny’s “Adamas” up to the various forms of the native crystal; my indicating the true nature of the ancient Amethystus, Callaina, Hyacinthus, the Jaspis with its subdivisions, the Lyncurium, Lychnis, Murrhina, the Onyx of the Greeks, Sandaster, Sphragides, &c. Of these attributions of mine the greater part were original, and proposed for the first time in this treatise; one or two were suggested by the timid conjectures of previous writers, but never before established upon a basis of sound deductions. It is not therefore a matter of wonder that a few out of their large number should have been dis-

puted; nevertheless, in all these cases, upon again accurately verifying the grounds of my previous decisions, I have not discovered any reason for reversing them.

These works of Nature, by their beauty and the wonderful symmetry of their primary forms, have from the very dawn of science aroused the speculations of inquiring minds, which discovered in them the special manifestation of the creative energy of some higher power. The subtle theories framed to account for such phenomena seem to me too ingenious and too curious to be allowed to rest in the oblivion to which they have been so long consigned, and therefore, in completing the "Introduction," I have annexed a summary of the most important amongst them, which probably will not prove to the reader one of the least interesting of my additions. These elaborate hypotheses do not, certainly, carry conviction along with them when they come to be reduced to their real principles; nevertheless, modern science, with all its formidable array of electrical, magnetical, and polarizing instruments, test-tubes, and hydrometers, has hitherto failed to supply any answer of much more intrinsic worth when stripped of its pompous cloak of technical terms.

I have also added largely to the number of quotations, and descriptions of relics illustrating the relations of this subject to history and to art, and in so doing have gone further into the details of both traditional and long-celebrated jewels: points that give an interest and a value of its own to this department of Mineralogy. Another addition required for the completeness of the modern side of my undertaking is the view now inserted of the most remarkable fluctuations in the selling-price of precious

stones, from the earliest times of which any notices can be arrived at down to the present day.

The notion of embellishing my pages with representations of the materials treated of therein, as vivified by antique genius, in the form of engraved gems, has been highly approved of by persons of taste. In the present edition I have inserted an almost entirely new and larger series, in the execution of which Mr. R. B. Uting has in many instances surpassed even his former excellent reproductions of Glyptic work. They are also now so arranged as to illustrate in some measure the subject of the articles which they decorate.

These contributions towards the completeness of my scheme—as large as untoward circumstances permit—these advances towards my idea of a perfect work—an idea that always recedes before me as fresh materials pour in from all quarters, and new sources of knowledge continually open forth—will, as I trust, render the present edition more instructive and entertaining to the reader, as well as more deserving of the praises bestowed upon its predecessor.

C. W. KING.

Trinity College, March, 1867.



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NATURAL HISTORY

OF

PRECIOUS STONES AND THE PRECIOUS METALS.

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INTRODUCTION.

MINERALOGY OF THE ANCIENTS.

PLINY has quoted by name numerous writers upon Mineralogy, for the most part Greeks, from whom he drew in great measure the materials for Books xxxvi. and xxxvii. of his 'Natural History.' The principal amongst these, to judge by the character of his quotations, and his incidental notices of the authors themselves, were the following:—*Sotacus*, cited as "the most ancient writer on the subject" (xxxvi. 38): and who appears to have been a physician at the Persian court, like *Democedes* or *Otesias*, for he stated in his work that he had seen the wondrous gem, the *Dracontia*, "*apud Regem*," "in the possession of the King," who being designated by this sole title, could, in accordance with Grecian usage, have been no other than the King of Persia. *Sotacus* therefore must have flourished before the Macedonian Conquest. *Theophrastus*, Aristotle's successor, much of whose little treatise Pliny has incorporated into his Book xxxvi.* *Sudines* and *Zenothemis*, his

* In the quotations from Pliny throughout this work, the old-established division of the chapters has been observed; although the text followed is that of the last editor, Jan's. That scholar by the aid

main authorities as regards the true Precious Stones: the latter writer had evidently visited India, as may be deduced from his account of the Sardonyx, its proper localities, and the mode in which it was employed by the natives. *Nicander*; perhaps meaning the physician, author of the 'Theriaca,' into whose poetical pharmacopœia gems entered largely by reason of their supposed inherent virtues. *Democritus*, the philosopher of Abdera, who had devoted himself, besides speculative philosophy, to the study of Natural History in all its branches. *Zoroastres*, a Magian as his name informs us, quoted by Pliny for his definitions of the "Daphnœa" and "Exebœus" and subsequently by Marbodius, concerning the virtues of Coral. That, however, he did not confine himself to the elucidation of the mystical properties of stones, appears from his notice of the Exebœus, "that it was used in the arts for burnishing gold." *Callistratus*, who treated of the Precious Stones exclusively. *Metrodorus Scepsius*, who seems to have been the celebrated confidant and counsellor of King Mithridates, that great amateur in gems. *Zacharias* of Babylon, who had dedicated to the same monarch a treatise upon the mystic virtues of Stones: "describing their influence on the fortunes of mankind." He may have been a Jew, the name being Zachariah Grecized; the Persian alphabet having but one character for the L and the R. *Archelaus*, "who was King of Cappadocia," and therefore must be the father-in-law of Herod the Great, mentioned by Josephus. *Boecchus*, an African by his name, and probably the Second, King of Getulia and Mauritania, Antony's ally at the battle of Actium. King *Juba II.* of Numidia, son-in-law of Cleopatra, and

of the lately discovered Bamberg MS. (of the tenth century) has been enabled to correct many of the innumerable corruptions and yet more mischievous "emendations" which had previously rendered much of this part of the 'Natural History' perfectly unintelligible.

confirmed in his dominions by Augustus; completing the trio of royal mineralogists, all contemporaries. The loss of Juba's treatise, considering his geographical position and his opportunities for obtaining exact information (the succeeding articles will show how large a proportion of the "coloured" stones the Romans drew from the North African provinces), is perhaps the greatest we have to deplore in this sad catalogue of *desiderata*. Latest of all came *Asarubas*,* apparently of Punic extraction, and Pliny's contemporary, for he cites him as "qui de his nuperrime scripsit, vivitque adhuc Asarubas" (xxxvii. 11). His African origin may be inferred not merely from his name but also from his being quoted as to the existence of a lake in Mauritania that produced Amber.

Of all this extensive literature (Pliny cites by name thirty-six authors in all), nothing whatever is extant beyond the meagre treatise of Theophrastus (composed shortly before B.C. 300), and the elegant, but, in a scientific point of view, almost valueless poem of the 'Pseudo-Orpheus,' the date of which is quite conjectural. Theophrastus has treated chiefly of the mineral substances used in the arts, their supposed origin, nature, and localities; briefly noticing, as secondary matters, the few Precious Stones known to the Greeks of his age. This book of his being the sole relic left to exhibit the state of mineralogical knowledge amongst his countrymen, a summary of its contents will not be out of place here.

Sections 1-5 treat of the origin of Stones, their differences, and qualities; 6, 7, of Marbles; 8-16, of fusible Minerals, Copper-mines, Pumice, and Coal (anthracite); 23, 24, of Gems used for signets: the Sard, Jasper, Sapphirus, Emerald; 25-29 contain the description of these Gems and

* "Our-God-is-Baal."

their varieties, also of the Carbuncle, Lynceurium, and Amber; 30-35, of the inferior Gems, also used for signets;* 36-39, of Pearls, Coral, Gold and Silver ore.

The Second Part of the Treatise describes the Earths used in the arts, Ochres of various colours, and other pigments; 40-42, of the composition of Minerals in general: as formed either of earth or sand, or lime, and of their distinctive properties; 43, 44, of Gem-engraving and the substances used therein: the Armenian-stone (Emery); 45-47, of Touchstone, and the Assaying of Gold; 48, 49, of Earths in general, Glass, Copper-ore, Bitumen; 50-55, of Ochres and Azure; 56, 57, White-lead and Verdigris; 58-60, of Cinnabar and Quicksilver; 61-63, of Pigments, and where found; 64-69, of Gypsum and Stucco-work.

The treatises, however, of Sudines, Sotacus, and Zenothemis were, as Pliny's extracts show, confined to the subject of the Precious Stones and Gems. Sotacus must have been earlier than Alexander's period, for the reason above adduced; the others may be supposed to have flourished under the Ptolemies, when Alexandria had become the grand entrepôt of the Indian trade. Some of them appear to have visited the gem-producing regions as jewellers and merchants (like Tavernier and Chardin on the mission of Louis XIV.), for the quotations from their works bear the stamp of practical precision.

* The Greeks termed a precious stone, in its native state, λίθος (tem.) or φάρος; after it was engraved, σφραγίς. The Romans used "lapillus" and "gemma" in the same distinctive senses. The latter word, properly signifying "a bud," was applied by that rustic people to the stone in a ring because it projected from the gold in the same manner as the bud out of the bark. Isidorus indeed fancifully derives "gemma" from "gummi" "because it is lucid like gum," and Salmasius more learnedly but quite as absurdly from ἔμμα the Æolic form of ἔμα, "an ornament."

Aristotle's 'Lapidarius, de novo ex Græco traductus, A.D. 1473,' is a book I have never been able to get a sight of. Nothing of the kind is to be found amongst his collected *Greek* treatises, at present. But from the extracts given by the older mineralogists like Camillo and De Bost, it would appear to be no more than a mediæval compilation, fathered upon the great philosopher, and much of the same character as the 'Lapidarium' of Marbodus, to be noticed farther on. It is always quoted by Camillo under the title of Aristotle's 'Liber Mineralium.' Its spurious nature is, indeed, abundantly manifest from the quotations therefrom made by the very writers who appeal to it as the supreme authority. To give an example, Marbodus has in the notes to his 'Prosa de XII. Lapidibus':—"Aristotle in his 'Book of Gems,' teaches that the Emerald, hung about the neck or worn on the finger, protects against danger of the falling-sickness. We therefore recommend unto noblemen that it be hung about the necks of their children. It is also approved in all the forms of divination, as well as in every other undertaking, and if worn on the finger it augments the dignity of the wearer both in presence and in speech." And Camillo, after mentioning that within his own recollection a mass of iron of notable bigness had fallen from the sky in the province of Lombardy, cites Aristotle as recording a similar phenomenon. But the decisive proof of the spuriousness of the work is the fact of its never being quoted by Pliny amongst the other mineralogical treatises he makes use of. The forgery, however, goes back to an early date, seeing that Marbodus refers to it as a standard work in the eleventh century.

As for the *Adiuvā* of the *Pseudo-Orpheus*, Tyrwhit, the last editor of the poem, considers it to be the production of some Asiatic Greek, and written in the fourth century,

after the profession of Magic had been made a capital offence by the law of Constantius in his ninth Consulship. He even conjectures that the "god-like prophet" alluded to (v. 74) may be the philosopher Maximus, Julian's instructor in divination, who was put to death under Valens for alleged complicity in the plot of Hilarius and Patricius. But this hypothesis appears to me to rest on no sufficient grounds. Had he written so late as the reign of Valens, the poet could not have spoken of sacrifices to the gods as matters of public and regular occurrence; and certainly he would not have let slip the opportunity of inveighing against the Christians, the then triumphant enemies of the ancient worship. As for his lamentations over the ignorance of mankind, their hatred of virtue, and the suspicion with which they regarded Magicians (points upon which Tyrwhit builds his strongest arguments), all these would equally apply to any previous period of the Empire, throughout which others, before Maximus, had commonly been put to death on the charge of magical practices. Besides, the actual allusion to the decapitation of the prophet was clearly intended to refer to the fate of Orpheus himself, who had been named in the preceding line. For *Orpheus* is only mentioned as the author of the poem by Tzetzes, that is, not before the twelfth century, in his Commentary upon Lycophron: whilst the very few MSS. of it, still extant, prefix no author's name at all. In fact another poem 'On Ceremonies,' existing in the same Collection, is there ascribed to Maximus himself; a circumstance which alone, as we may suspect, induced Tyrwhit to place the *Λελικὰ* also at the same low date.

But if any competent scholar will take the trouble to compare this poem with the 'Argonautica,' which also

goes under the name of Orpheus (but is generally attributed to *Onomacritus* the Athenian, who flourished as early as B.C. 516),* he will not, in my opinion, fail to perceive that both are works by the same hand. The close resemblance in the versification, in the fondness for spondaic endings, in the diction, in the reduplication of epithets; and as regards the spirit, the peculiar form, marking a purely Grecian epoch, under which the tender passion is pictured in both, clearly indicate their common origin. Now to establish their common antiquity. The '*Argonautica*,' being comparatively a mere sketch, must have necessarily preceded the elaborate composition by Apollonius Rhodius upon the same theme. The story as told by Orpheus differs from the latter in many important particulars, besides being narrated with much more of primitive simplicity: indeed it is hardly conceivable that any one coming *after* Apollonius should have attempted to compete with an epic of such established reputation; or that, having such audacity, he should have deviated so far from his prototype. But, on the grounds above stated, if Onomacritus is the author of the '*Argonautica*,' he must also be considered the author of the '*Lithica*.' Indeed the question of the high antiquity of the latter is set at rest, if we accept the statement of the scholiast "Demetrius, son of Moschus," that it gave Nicander the idea of his '*Theriaca*.' Now as Nicander flourished at the court of Attalus III., about B.C. 135, this circumstance presupposes a much earlier date in a work selected for his model by a writer of no mean order.

There are many expressions in Pliny, where he is laughing at the mystic powers attributed to gems by the Magi of old times, which seem direct allusions to pas-

* He was banished by Hipparchus for interpolating the Oracles of Musæus with others of his own composition.

sages in this very poem: although he nowhere cites Orpheus by name. In addition to what has been said above, as to the internal evidence to its antiquity supplied by the composition itself, its poetry is certainly of better quality than could have been produced by a Greek of the Lower Empire, especially when treating on religious topics. It is of a totally different stamp from that of the Sibylline Oracles, forgeries of that period.

Who the narrator is does not appear. The precepts are given in the first place by a certain diviner, Theodamas, to his unnamed host (who retails them in these verses), and he then goes on to the end with the instructions of the same nature imparted by Helenus to Philoctetes. The 'Tale of Troy' and the events of the siege being frequently referred to by Theodamas, the absurdity of supposing the author to be Orpheus, becomes yet more conspicuous; that worthy having been the companion of the Argonauts in the preceding generation. The text of the MSS. being extremely corrupt, I have not scrupled in my version to adopt the conjectures of Gesner and Tyrwhit, wherever it was impossible otherwise to extract a sense from the old readings.

Epiphanius, bishop of Salamis in Cyprus, composed (about A.D. 400) a small tract 'Upon the Twelve Stones of the Rationale in Aaron's Breastplate;' which St. Jerome mentions as having been presented to him by "that holy man" its author; unable, clearly, to say anything more in its praise. In this compilation, the worthy prelate appears, occasionally, to be referring to some valuable sources then accessible; but most provokingly he either makes use of them from memory, or else transcribes without understanding their meaning; the latter the most probable explanation. In his attempt to condense his originals, his notices are become full of the most palpable blunders, and

of confusion between one species and another. His principal object in writing was to point out the medicinal virtues of the several stones. Nevertheless, a few things of considerable interest to the mineralogist are to be gleaned from amongst his undigested gatherings: such as his definition of the three species of the *Hyacinthus*; and of those of the *Jaspis*; with his allusion to the *Adamas* as a *cerulean* stone, a proof that his ancient authority upon that head had understood by the name the *blue* *Corundum*, our *Sapphire*.

The book '*On Rivers*,' which goes under *Plutarch's* name, but by some has been attributed to the grammarian *Parthenius*, the preceptor of *Virgil*, notices particularly the precious stones found in all the principal rivers of Asia and Europe, or in the mountains by which they flow. Unfortunately these notices also are of no scientific value, having reference only to the medicinal or magical properties of the gems indicated. To give a specimen of this catalogue of things marvellous: "In the *Pactolus* is found, though rarely, a stone like the *pumice*, which changes its colour four times a day. It is only to be discovered by little girls as yet too young to know anything, but if worn by nubile virgins it protects them from all attacks upon their chastity." "The *Sagaris* produces the *Autoglyphus* (natural intaglio) representing the figure of *Cybele*: this stone if found by one of her emasculated devotees, enables him to endure courageously all supernatural manifestations. Here, too, is found the *Aster*, which flames in the dark, hence called '*Ballen*,' the *King*, by the *Phrygians*." But the climax of "travellers' tales" is reached in his '*Thrasydæilus*' (*Bold-coward*), "found in the *Eurotas*, in shape like a helmet, and so named because as soon as it hears the trumpet sounded it leaps out upon the bank; but if the *Athenians* are mentioned it jumps

back forthwith into the deepest part of the river. Many of these stones, lie consecrated in the temple of Pallas of the Brazen-House in Sparta." Or again, "In the Maeander is found a stone called 'Sophron' (the Sensible) by the rule of contrary, for if you throw it into any one's lap he goes mad instantaneously, and murders some of his family; but recovers his senses after having propitiated the Mother of the Gods." The only thing that gives a value to this compilation of extravagances out of that province wherein "*Græcia mendax*" appears to have surpassed herself, is the circumstance of the maker's quoting his voucher for each statement; and thus attesting the large number of those who *had* before him written upon the same subject. Many of these writers are not to be met with in Pliny's list; their names are therefore worth transcribing here; viz., *Agatharchides*,* *Archelaus*, *Aristobulus*, *Deryllus*, *Dorotheus* the Chaldean,† *Heracitus* of Sicyon, *Nicias* of Mallos, *Theophilus*, *Therasyllus* of Mendes. The nature of Plutarch's quotations from these writers would indicate that they had principally busied themselves with the reputed efficacy of gems in medicine and in magic. It may be conjectured that although Pliny names none amongst them, save Archelaus, in the list of publications serving him in the compilation of Book xxxvii, yet he both knew them and (as the character of Plutarch's extracts leads us to suspect) contemptuously classed them without further notice amongst the "impudent Magi," samples of whose "*infanda vanitas*," "awful lying," he occasionally introduces for the purpose of exposure. To the above names Suidas adds that of

* A writer whose loss is greatly to be deplored, to judge from the value of his fragment upon the Egyptian gold-mines: a translation of which I have given under that head.

† A fragment of his poem on astrology is usually annexed to Manetho's.

Æsopus "reader to King Mithridates," who, to judge from the citation "on the Pan-fish," followed in the same line of the marvellous.

The 'Poetical Description of the Inhabited World,' composed by *Dionysius*, hence entitled "*Periegetes*," a native of Charax, in Susiana, contains many important notices of the different Eastern localities producing the several precious stones; which will be found called into use, under their respective heads, in the course of this 'History.' The epoch of the author is a matter of conjecture, but is usually placed at B.C. 30. As, however, in one passage he alludes to the "Persian conquests" of his patron, he must certainly have flourished long prior to this date, and probably under one of the early and enterprising Seleucids.

Of ancient Greek Mineralogy this is absolutely all that remains. Of Roman, besides Pliny's inestimable though much too compressed compendium, somewhat more is extant, although it is of but trifling importance. *Solinus*, who seems, from certain incidental notices* in his descriptions of places, to have belonged to the weakly Revival of literature in the age of Constantine, has in his 'Polyhistor' particularly discussed the article of the precious stones furnished by the several regions he is passing in review. His notices are often extremely useful, inasmuch as he evidently aims at a more precise and technical description of the various kinds than that to be obtained from his precursor, Pliny; and indeed he displays in his definitions the knowledge of the practical jeweller. For example, it is impossible to derive a clear notion of what stones the Romans understood by certain denominations (notably the "*Hyacinthus*" and the "*Sardonyx*") from Pliny's vague description of them, but for the aid of the

* He is first quoted by Priscian, the grammarian of Cæsarea, in the fifth century.

more systematic definition of the same things offered by Solinus.

Lastly, many gems and minerals will be found explained in the 'Origines' (a brief Encyclopædia) of *Isidorus*, bishop of Seville in the seventh century. This work has a certain value as containing quotations from many authors now lost. Little, however, is to be gathered from his extracts bearing upon our subject; since he has evidently, in this branch, contented himself with abridging Pliny's articles, and that, too often, without any very clear comprehension of his meaning. From Solinus, likewise, he has transcribed some passages verbatim: for instance, the characters of the "*Hyacinthus*." He had, however, some third source at his command, whence he drew his notices of the medicinal virtues of gems, which with him is the most important point in the estimation; and this source was either Epiphanius's tract, or else the original, laid under contribution to so little purpose by that abbreviator. As he never names his authorities, it remains a matter for conjecture who this oracle could have been. From the nature of the case it must be inferred that he had written in Latin; and judging from a certain similarity in parallel passages, he may have been the pretended *Evax*, whose singular composition, belonging partly to ancient, partly to mediæval science, shall be the next to come under our consideration.

Some four centuries after Isidorus we find *Marbodius* (*Marbœuf*), bishop of Rennes, publishing, some time between 1067 and 1081, his '*Lapidarium*,'* styled in the proœmium "An Abridgment of the bulky volume composed by *Evax*, King of Arabia, and sent as a present to Tiberius Caesar." Nevertheless, whole passages in the

* Long attributed to *Mæcer*, a poet of the Augustan age, and first printed as Book v. of his treatise '*De Re Medica*.'

poem are nothing more than pieces taken bodily out of the 'Origines,' as they stand at present, and put into rude hexameters. Intermixed come occasionally what are unmistakable extracts from Orpheus, whom, by the way, he quotes at length, under 'Coral,' as "Metrodorus," referring in the same passage to Zoroaster also. Now, Lessing is of opinion that a treatise on stones ascribed to Evax was really then current for genuine, and that there is no reason to doubt the assertion of Marbodius that his own is merely a condensation of the same. But Evax is never mentioned by Pliny; whence it may be concluded that the book passing by his name was compiled and put forth under that specious title late in the Decline, when these, primarily Oriental, notions as to the potency of gems had become the general belief and had been adopted even by the philosophers of the times.

Contemporary with the Breton Bishop of Rennes flourished the Byzantine *Michael Psellus*, tutor to the emperor Michael Parapinaces, and the most learned Greek of the eleventh century. Amongst his numerous works exists a brief tractate 'On the Virtues of Stones,' describing the uses in medicine of the Diamond, Hæmatite, Amethyst, Carbuncle, *Æschates*, Beryl, Galactites, Amber, Jasper, *Idæus-Dactylus*, Crystal, *Lychnites*, Magnet, Onyx, Caprinus, *Sardonys*, Selenites, Emerald, Hyacinthus, Chrysolithus, Chryseleotrus, Chrysoprasus, Chalazias, Topazion.

His notices are not worth much as regards the natural history of his subject, of which he evidently knew nothing, and, as evidently, regarded as beneath the consideration of a philosopher. Of his "deeper science" take the following characteristic specimens:—"the *Idæus-Dactylus* (Jove's-finger) is produced in the isle of Crete, and in shape is like a man's thumb, and of the colour of iron. This

stone is the most discriminating of all stones, inasmuch as it brings to maturity the embryos that proceed from legitimate copulation, but destroys such as be unlawful or incestuous." "The Lychnites is a stone that gives the faculty of seeing in the dark, if hung about a person's neck. It also cures fluxions of the eyes, if tied in a linen rag around the forehead."

The causes of these virtues, he says, had been investigated in ancient times by *Anaxagoras*, *Empedocles*, and *Democritus*; and more recently by *Alexander* of Aphrodisia (in the third century), "a person very ready to explain all the mysteries of Nature, of whatever sort."

About a century after Psellus shines forth *Mohammed Ben Mausur*, who may justly claim the honour of being the first since Pliny (beyond whom he is far advanced in many points) to compose a really scientific and systematic treatise upon this branch of Mineralogy. This was his 'Book of Precious Stones,' dedicated to the Abasside Sultan of Persia, Abu Naser Beharderchan.* In this work he treats of each stone under three heads, viz., "Properties, Varieties, and Places producing it." The knowledge of the true characters of the different species displayed in every one of his articles is absolutely marvellous, considering the age in which he wrote. He actually anticipates by many centuries the founders in Europe of the modern science, Haüy, Möh, &c., in several of their supposed discoveries, such as defining the different species of the Corundum and Spinel, and in basing his distinctions upon the hardness and specific gravity of the several kinds. Another thing that gives the work a special interest is the evident fact that the author drew from that fountain-head of the science whence the early Greek mineralogists had obtained,

* Von Hammer has published a translation into German, in his 'Mines de l'Orient,' vol. vi.

though much less perfectly, all their information. In the course of my dissertations many of these coincidences will be pointed out, especially as connected with the true origin of the ancient nomenclature of gems. A truly practical naturalist, he totally ignores a part of the subject then all important with mediæval Europe, and one that now remains for us to pass under review.

Marbodius was, to all appearance, the author of the metrical version into Norman-French of his 'Lapidarium,' which is found written in a contemporary hand, in the oldest MS. of the poem. The universal reception of the chimerical science promulgated by him and by Psellus, naturally led to the multiplication of treatises upon stones considered merely as medicinal or magical agents, and thus has occasioned the neglect and consequent loss of the invaluable memoirs of such acute and practical observers as Sindines, Sotacus, and Zenothemis. To this, amongst the Latins, was added another cause for such neglect: Pliny's condensation of their separate publications had brought about the complete obscuration of these his predecessors; whilst amongst the Greeks his contemporaries, and those that followed, Natural History was no longer studied except with reference to medicine or magic, sciences at the time and long after very closely connected.* The 'Lapidarium' of Marbodius is the last work professing to treat, however imperfectly, of the natural history, in its proper sense, of the precious stones. The numerous

* Perhaps the most illustrious instance of medicine seeking aid from gems was the last illness of Lorenzo dei Medici. When his fatal disease, a slow fever, had baffled the skill of his regular physician Pier Leoni da Spoleto, another, then in the highest repute, Lazzaro dal Tivino, was called in, who placed his whole dependance on the powder of pearls, of emeralds and of other precious stones. Politiziano in all good faith ascribes his failure in saving his patient's life to the mere fact of his having come too late for his remedies to have a fair chance.

'Lapidaria' extant in MS., some as old as the thirteenth century, are of a totally different class, and bid farewell not only to science but to common sense. They treat not so much upon the *natural* potency of gems over the health or fortunes of mankind, whether "in medicine potable" or worn as jewels, as upon their supernatural powers in commanding the favour of God and man, or in baffling the influence of demons and the various evils due to their malice and agency—plagues, murrains, tempests.

The main object, however, aimed at by the composers of these directories is to define the peculiar virtues of the "Sigils" engraved upon, and augmenting the innate potency of the appropriate gems. Here a new class of ideas comes into play, of which no traces are to be discovered either in the 'Origines,' or the 'Lapidarium' of Marbodas, although faintly hinted at by Pliny when ridiculing the impudence of the Magi for ascribing similar virtues to stones (the Amethyst and Emerald) if engraved with certain devices. Such novel notions are evidently due to the influence of the Crusades, and of the intercourse with Orientals resulting therefrom, upon the minds of the learned in Europe. These notions were brought in upon the same tide of Arabic science that diffused the taste for alchemy throughout the West, and were by their nature intimately connected with astrology, now once more cultivated, and with a zeal before unknown even under the Lower Empire.

The strange misinterpretations of the most familiar classical subjects, as represented on gems, betray so total an ignorance of classical mythology as to evince that such could never have been imagined by the literati of Europe, amongst whom the study of the Latin authors had always flourished more or less vigorously, and whose writings often abound with correct allusions to profane history and fable. It is therefore a necessary inference that these

misconceptions were borrowed from the Arabians (of Spain for the most part) and similarly from the Jews of the same country, in high repute then both as physicians and as alchemists. Much, too, was learnt from the African and Syrian doctors; for example, we find the Rosicrucians pretending that their founder, the mysterious "A. C.," acquired all his arcana at the Arabian College of Damascus. In fact many of the sigils described (of a nature never met with in antique art) bear a striking resemblance to the "Myriogeneses," or symbolical figures representing the astral influence of the thirty degrees in each Sign, of which Scaliger has given a list, translated from the Arabic, in his notes upon Manilius. These Myriogeneses are indeed attributed by the astrologers to the ancient Egyptians, but internal evidence betrays that such ascription is a mere pretence, made in order to give the sanction of antiquity to the doctrines founded upon them. That this conclusion of mine is not a bare assumption is manifest from the very names of the writers 'On Sigils' as published by *Camillus Leonardi* (Camillo di Leonardo). This sage, who flourished at Pesaro at the close of the fifteenth century as physician to Cesare Borgia, has in his 'Speculum Lapidum'* (written in the year 1502), collected all the treatises on the subject that came within his reach. The names of their authors, we find, are all such

* Last. Dolce in his 'Trattato delle diverse sorti delle Gemme,' Venice, 1565, dedicated to Card. Campeggio, has with the most barefaced audacity published a literal translation into Italian of the whole of Camillo's book, without once mentioning his name, nay, in the dedication claiming the whole for his own composition, "questa mia fatica." Dolce must have met with the 'Speculum' in MS., for I cannot discover it to have appeared in print before Petrus Arlensis published it with his own 'De Sympathia,' about fifty years later. But Dolce's bringing out such a work and under such distinguished patronage proves that the belief in sigils was even then as flourishing as ever.

as figure in the library of the alchemist: *Hermes Trismegistus*, as the author of the 'Liber Quadripartitus;' *Ohael* (Jael), "a most ancient doctor amongst the Children of Israel, in the Wilderness;" *Ragiel*, in his 'Book of Wings,' "a tractate indispensable to all students of magic;" *Solomon*; and *Thetel*, better known as '*Rabanus Maurus*.' This last was Abbot of Fulda in 822, and reputed the most learned man of the Carlovigian era. As he had made a pilgrimage to the Holy Land (which indeed was the indispensable complement to the education of a philosopher in those times) he may possibly have acquired there his deep knowledge of the science of Sigils.*

To give an insight into the mode in which these wizards interpreted the designs of ancient art, and of the powers they attributed to the same on the strength of such interpretations, a few examples shall be adduced, premising with the explanatory introduction of Camillo's own: "All things in nature have a certain form, and are subject to certain influences. Stones therefore, being natural productions, have a certain specific form, and are likewise subject to the universal influence of the planets. Hence if they be engraved by a skilful person under some particular influence, they receive a certain virtue as though they had been endowed with life through that engraving. But if the effect intended by the figure engraved be the same as that produced by the natural property of the stone, its virtue will be doubled and its efficacy augmented.† For example, the property of the Sicilian Agate

* Similar catalogues of the virtues of sigils, "*Pietres d'Israel*," are common in MS. of the Middle Ages. I am informed that amongst others the British Museum possesses two, full three centuries earlier than Camillo's date, but containing pretty much the same matter.

† There were, however, doubters even at that credulous epoch, for he observes: "*Non parva nec inutilis difficultas inter celesterrimos doctores*

is to counteract the poison of the viper: you will therefore find engraved upon it the figure of a man holding a viper, the virtue of the stone being thus denoted by the figure that it presents. But if the engraving should represent Ophiuchus, a constellation possessing the power of resisting poisons, then by knowing the constellation you will recognise the virtue of the stone: and furthermore its efficacy will be doubled through the potency of the engraving upon it. And this rule holds good for all the other gems." Ragiel lays down that "a Ram, or a bearded man's head (Ammon), on Sapphire, defends from many infirmities, from poison, and from oppression. A Hoopoe with the herb dragon in front, upon Beryl, hath power to summon the water-spirits, and to force them to speak. It will also call up the dead of your acquaintance, and oblige them to respond to your questions." Again Chael has: "Man with long face and beard, his eyebrows raised, sitting behind a plough, and holding up a fox and a vulture, with four men lying upon his neck—such a gem, if placed under your head when sleeping, makes you dream of treasure and of the right manner to find out the same." (The sigil thus curiously described is the favourite Roman type, the "Quattuor Tempora," the Year attended by the Four Seasons, his children.) "Man seated and a woman standing before him with her hair hanging down loose to her loins, the man looking upwards—this cut on Carnelian hath the virtue that whoever is touched therewith shall be led to do the owner's will immediately" (Hercules and Iole). "Man with a wand in his hand, seated upon an eagle (Jupiter), engraved on Hephæstite

existit de virtute lapidum; cum nonnulli eorum dicant nullam virtutem inesse lapidibus; quod falsum esse arbitramur illosque dimittamus cum totaliter a veritate discrepent."

or Crystal, must be set in a brass or copper ring. Who-soever looketh upon the stone of a Sunday before sunrise shall have victory over all his enemies. If he look upon it of a Thursday, all men shall obey him willingly. But he must be clothed in white, and abstain from eating pigeons." Interpretations like the above of the most easily intelligible types in classic mythology are the rule with these doctors: and in truth the country that gave birth to these fancies is indicated plainly enough by the fact of Camillo's designating many gems by their *Arabic* names, such as "Gagat romæus," "Kaman," "Zumech," and "Ziazia." The sigils most cognate to the specific virtue of each of the precious stones are thus stated upon the highest of all authorities, that of *Hermes Trismegistus* himself in his 'Liber Quadripartitus':—"1. Head with a long beard and a little blood around the neck cut on Diamond, confers victory and courage, and defends the body from hurt. It also gives success in obtaining your petitions. 2. Virgin, or a Torch, on Crystal, preserves the sight. 3. Man making a speech, on Ruby, bestows honours and riches. 4. Man playing on an instrument, on Sapphire, exalts to dignity, and gives favour with all men. 5. Grey-bound, on Beryl, avails for the obtaining of honour, wealth, fame, and friendship. 6. Cock, or Three Maidens, on Agate, renders the person acceptable unto all men, gives power over the spirits of the air, and is of potency in magic. 7. Lion, or *Murilaga*, on Garnet, gives riches and honour, cheers the heart, and drives away sorrow. 8. Stag, or Snake, on Onyx, gives the wearer courage, drives out devils, but likewise commands and convokes them, and binds noxious winds. 9. Man like a merchant carrying wares to sell, or Man seated under a centurion, engraved on Emerald, gives wealth and victory, and delivers from

evil. 10. Bull, or Calf, on Loadstone : the wearer thereof can safely go into all places without molestation, and is protected against all spells and witchcraft. 11. Horse, or Wolf, on Jasper, keeps off fevers, and stanches the flowing of blood. 12. Man raised on high, or crowned, on Topaz, renders the wearer good, and beloved in the sight of all men. 13. Armed man holding a sword, on Sard or Amethyst, makes the wearer get a good and perfect memory, and to acquire wisdom. 14. Stag, or Goat, on Calcedony, augments riches, if the gem be kept in thy money-box."

The Esculapius of Pesaro thus offers his treasury of such invaluable recipes to his redoubtable patron, who, by the bye, does not seem to have been as black as he is painted by Protestant and Catholic alike, chiefly, it may be suspected, on the score of his parentage. Had not his father been a Pope and a politician, Cesare would probably have passed for "virtuous as a gentleman ought to be, virtuous enough" for an Italian prince of those days; and confessedly a more sagacious and a better ruler for his subjects than most of his contemporaries. Some new features in his character are disclosed by his physician. "My book I entitle 'The Mirror of Stones,' wherein their nature, properties, engravings, and the knowledge of many secrets, may be viewed as it were in a looking-glass. I, therefore, who am attached, as bound both by duty and affection, to your Highness, in whom rest all our hopes, who are both father and prince of your country, to your Name do I dedicate this work, inasmuch as you are *fond of study*, and devote yourself not merely to arms and warfare, but also with equal ardour to polite learning, so that when you have a moment's leisure you may cast an eye and a thought upon my pages. In the which should you find ought that is incorrect, and stands not the test of your sound judg

ment, you must impute it to the slightness of my ability, and excuse the same, for

‘Non omnia possumus omnes.’

But should you discover anything worth reading therein, you must put it down to the account of those most worthy doctors from whom I have compiled these matters; and on the score of their high authority and established rank, give this my little book admittance amongst the other, so to speak, innumerable volumes of *your most magnificent library*; neither disdain to reckon it amongst their number, in order that whenever you look upon it you may become warmer in your affection for your own Camillo. ‘Tis truly a small return, most gracious and magnanimous Prince, for your favours towards me, but with your accustomed benignity you will consider, not the work itself, but the intention of its author.”

In the fifteenth century *Georgius Agricola* did at last do something fresh for the Natural History of Minerals in his ‘*De Ortho et Causis Subterraneorum*,’ written before 1485: interspersing notices from his own experience with the rest of his matter drawn from the ancients. In the following century, *Kentmann* and *Gesner* did something more for the science in their little essays, ‘*De Rerum Fossilium, Lapidum, Gemmarumque Figuris, &c.*’ published together in 1565. The insignificant attempts in the same direction of *Baccius*, and *Gabelchoverus*, though composed somewhat later, breathe the very spirit of the ‘*Speculum Lapidum*,’ except as regards the doctrine of Sigils, which by this time the advance of education, or the decay of faith, had almost exploded. The books of the two last-named writers, therefore, are equally deficient in amusement and in instruction.

It was not before the opening of the next century that a work on Mineralogy appeared which still retains any practical value—and that too in a very high degree. In the year 1609, *Anselm de Boot*, latinized into "*Anselmus Boethius*," a native of Bruges, and physician to the Emperor Rudolf II., published his book (written in 1600) * '*De Gemmis et Lapidibus*.' Of this a third edition came out in 1647, enriched with many good notes and corrections by *Tollius*. To it are appended the Greek text of Theophrastus with a commentary, and another shorter work, '*De Gemmis*,' both by *Johann de Lact* of Antwerp: the latter dedicated to Elizabeth, "sexus sui præstantissimæ gemmæ," daughter of the unfortunate Frederic, king of Bohemia, and grand-daughter to our James I. Whoever desires to become acquainted with a work exhibiting in every line the mode of thought of that age, in its extraordinary mixture of credulity with the most extensive and various learning, and great practical experience, will find his trouble amply repaid by the perusal of this book, written as it is in elegant and easy Latin by the confidant and helper of the imperial alchemist and virtuoso. The learned physician displays much critical knowledge in his attempts to identify gems known to the ancients by names transferred to others, quite different, in mediæval times; and it has been a satisfaction to me to find his attributions for the most part coinciding with my own, made independently; my researches into that particular division of my subject having been nearly completed before *De Boot's* dissertation came to my knowledge. In his disquisitions upon the innate properties of stones he draws a distinction that curiously illustrates the struggle then going on between traditional superstition and reason aided

* As he informs us, when noticing the selling price in Germany of the Bezoar.

by experiment. Whilst admitting, and to the fullest extent, all their medicinal virtues * as set forth in the mediæval Lapidaria, giving recipes for the extracting the "Spirit of Emerald," for compounding the "Ointment of Lapis-lazuli," and exhibiting the "Powder of Coral," &c., he denounces the belief in their magical potency for a snare of the Devil, equally as superstitious as derogatory to the idea of Divine Providence. To give a notion of his philosophy on this head: "The effects of gems are generally material, in few cases *spiritual*, and then only when acting through some means that must be held the *efficient cause* rather than the gem itself. For example, if the Carnelian, Jasper, or Hæmatite, be worn by a person that has suffered from the discharge of blood, and is thereby rendered weak both in mind and body, and the discharge be so stopped, it is possible that by means of this retention of its blood the heart may be so much invigorated, and the temperament of the person so far restored, that the individual may acquire courage in the place of cowardice, which indeed is an immaterial quality, but nevertheless dependent upon something material, namely the blood; as do every habit of the soul and act of the mind. But such effects as these, having a nearer cause, the abundance of the blood, cannot be properly ascribed to the gem itself. But that wisdom, eloquence, memory, and other virtues and habits of mind, can be generated or strengthened by the wearing of gems, as people have hitherto believed, is a great absurdity. For these qualities do not depend upon the humours and the spirits, as do cowardice, bashfulness, and timidity, but upon a part of the rational soul, and upon use productive of the habit."

* Newton likewise is said to have given credit in some degree to the medicinal efficacy of precious stones upon the health of the wearer. Boyle's faith went much further: see his curious 'Essay about the Origin and Virtues of Gems,' 1672.

De Boot was a practical mineralogist as well as lapidary, frequently citing specimens of rare stones from his own collection; and explaining improvements invented by himself in the mode of cutting precious stones. His notices of their native places, the trade in them, the current prices, the arts of working and of counterfeiting them, are admirably given in brief yet comprehensive details, displaying a thorough acquaintance with this department. And as regards these particulars, De Lach's essay, which was confessedly composed as a supplement to his predecessor's more extensive work, is deserving of the highest praise, and has furnished me with abundance of curious information whenever the jewelry of the Renaissance came to be considered. Both treatises have been the source whence subsequent writers upon precious stones have drawn all that is valuable in their pages; and that too without acknowledging their obligations: Dutens, for example, whose '*Pierres Précieuses*' (pub. 1777) is little better than an abridgment of De Boot's chapters upon the same heads. Under the heading "*De Lapidibus*" in De Boot's volume, the geologist will be amused with his clever woodcuts of fossil shells and teeth, and the high value in the pharmacopœia for which he gives them credit, apparently on the score of their singularity of shape indicating their specific virtues, according to the then received "*Doctrine of Signatures*."

My own plan followed in this work has been almost the same as that marked out by De Boot so long ago: a better one than which could not indeed be devised. It combines the ancient and mediæval with the modern views of this part of Natural History—a thing never attempted by more recent mineralogists, who have either treated upon "*Gems and Stones*" in a purely scientific manner, or else as matters of commerce, leaving untouched all their relations to archæology, to mediæval philosophy, and to art.

My object has therefore been, as a primary consideration, to establish a sound system of nomenclature for rendering the antique into our own; to define each species with precision, employing so much (and no more) of modern science as was necessary for the purpose; to consider the whole subject as thoroughly as my materials allowed in its bearings upon History and Art (as intimately connected with which I have introduced the two essays upon the Precious Metals); and whilst doing this, to supply accurate guidance to the purchaser, or admirer, in our own days, of these the choicest of Nature's treasures.

STONES, THEIR ORIGIN.

The secret process whereby Precious Stones are produced in the laboratory of Nature early engaged the attention of the philosophers of Greece, as doubtless similar speculations had long before employed the subtile ingenuity of their forerunners, the wise men of India and of Chaldea. Of such investigations the most elaborate preserved to us is that of Plato in his 'Timæus' (60 C), where, after describing the origin of metals, and of the *Adamas* (as quoted under that head), he thus accounts for the composition and for the various species of stones:—"With respect to the different kinds of earth, one sort being filtered through water in the aforesaid manner becomes a stony substance: as the water originally mingled with it, in the case where it is the weaker of the two in the mixture, is transformed into the shape of air. Now this air, on returning into its natural place, mounts upwards, for no vacuum surrounded it. Consequently it impels the air nearest to itself; this latter therefore, inasmuch as it is ponderous, being impelled, and enveloping the mass of earthy matter, forcibly squeezes and drives the same into those receptacles out of which the

newly generated air had evaporated: and the earth being compressed by the air is indissolubly solidified by the water into *stone*: that sort being the more beautiful which is transparent and composed of equal and homogeneous particles; the coarser sort being that which is formed in the contrary manner."

Besides this attempt to solve the mystery on scientific principles, our philosopher advances a more pleasing and poetical—perhaps an equally satisfactory, certainly a more intelligible, theory in his 'Phædo' (110 C), where, speaking of the "True World" or that above us in the heavens, he has, "The story is, that in the first place this supernal world presents exactly the same appearance, if viewed from above, as those children's balls covered with twelve different stripes; for it is multicoloured and divided into compartments of different hues, of which the pigments we have here below, that is to say those used by painters, are mere samples. But in that world* all the earth itself is made up of such tints, and in great part also of others still more brilliant and more refined than these; for one part is purple and wonderful for its beauty, another is gold-coloured, another whiter than plaster or snow so very white is it, and in the same measure that which is composed of the other colours surpasses all those in our painters' stock: and moreover, some portions are made of others

* Plato is evidently working up here some tradition he had gathered in his Eastern travels, of the Terrestrial Paradise seated on the Ner-budda, the Pison encompassing the land of Havilah (Mallva) producing fine gold and onyx. This province even then supplied the Persians with that gem in abundance; it was also, according to the national tradition, exceeding rich in gold—a proof of which Colonel Stirling justly discovers in the names of its towns, no less than fifteen of which commence with "Sone," gold. Plato's "brilliant colours" of the earth there, doubtless, allude to the strata of red and yellow ochres containing the gems. Ochres, in his times, constituted the sole stock of the painter.

yet more diversified, and more lovely than any we have ever seen. Moreover, even the hollow places also of this earth we are speaking of, being filled up with water and air, present the appearance of colouring, inasmuch as they reflect the diversity of the colours of the other parts, so that every single division of the land appears continuously painted. And in a region of such a nature as this, the trees, the flowers, and the fruits, come forth in a manner to correspond with the beauty of the rest. And similarly the rocks there, and the stones, have in the same proportion a polish, and a lustre, and a colour far superior to ours. And of those stones, the gems so much prized here, the Sardis, Jaspers, and Emeralds, and all such like things, are the mere fragments. For in that land there is nothing but what is of their quality, nay even still finer than they; and the cause of it is that the stones there are pure and not corroded nor corrupted as those with us, through decay and through the action of salts, in consequence of the conflux of the liquids hitherwards which produces disfigurement and diseases both in stones and in earth, and its animals and plants. For that earth is adorned with all these [precious stones] and besides them with gold and with silver, and with all other matters of like nature: for they are produced visibly, and are both numerous, and abundant in quantity, and plentifully dispersed over the soil; so that to behold the same is a sight to render the beholders happy."

But of all these theories by far the most precise and well-defined is that attributed to Aristotle, and received without any question as his by the early revivers of this science. I shall, therefore, translate it from Camillo's well-executed summary of its views; for this famous treatise "*On Minerals*" then evidently the test-book on the subject, has never yet, in spite of long continued search after it,

come into my possession. "The efficient or generative cause of stones has been variously assigned by different writers. But passing over their conflicting theories let us come to the true cause, and maintain with the greatest of philosophers, that the efficient virtue, or generative cause of stones, is a certain *mineral virtue* that subsists not merely in stones, but also in metals, and moreover in the substances that hold the middle place between these two species. And forasmuch as we are without a proper name for this virtue, this one, that is to say, 'The Mineral Virtue,' hath been attributed to it by inquirers; 'for things that we are unable to express by their proper names, we are obliged to define by a similitude, not that the same facts are examples of the manner in which this mineral virtue subsists in stones,' to use Aristotle's words. For we give an example not because a thing is done in the same way, but in order that those who are learning may form an idea thereof; and thus, by taking the case of animal seed, we can illustrate in what manner the mineral virtue, which we assert is the efficient or generative cause of stones, operates in stones.' Thus, we say that the seed of an animal is the superfluous nourishment descending into the spermatic vessels, and issuing out of those vessels. The efficient, or generative, virtue is infused in the seed itself, through means of which such spermatic matter is rendered fecundative, according to the doctrine held in natural history. The which virtue however doth not act by the means of its essence, but by the means of its inherence; as we say, for example, an artist is implied in the idea of an object made by art. So by a parity of reasoning we maintain that in fit matter for the production of a stone there subsists a formative or efficient virtue for the producing a stone of this or that species, according to the disposition or requirements of the matter, the place, and

the influence, where such matter is found ready for its operation. The which virtue is indeed designated by some 'the Virtue of the Heavens.' And this is what Plato means by saying that 'the virtues of the heavens are infused in proportion to the worthiness of the subject matter.'

"In Physics also it is granted that all formative or efficient virtue has some proper instrument in some particular species, through the means of which it effects or produces its own operation. For this reason we must adopt the opinion of Aristotle put forth in his treatise 'On Minerals,' and maintain that 'the peculiar efficient or generative virtue of stones, existing in the material of stones, which is termed mineral matter, is made up of two things; or, as it were, instruments, which instruments are diversified according to the difference of the nature or the species of the stones. Of which instruments, the one is *Heat* digestive, extractive or desiccative of *Moisture*, inducing form in the stone through the medium of the coagulation of its earthy particles, to which it is subjected by the unctuous moisture; and this heat is directed by the formative or mineral virtue of the stones themselves, which last is termed by Aristotle 'the Hot, Desiccative Cause.' Nor is it doubtful that such heat, if it were not regulated by some other condition, would be in excess above the nature of the stone, and would reduce it to ashes; and, on the other hand, if the heat were lessened, it would not digest the matter properly, and so not bring the material of the stone to its best and perfect form, because it was insufficient to produce that effect. The second instrument is *Cold* subsisting in the matter of the aqueous moisture, which aqueous moisture is affected by the dryness of its earth, and this is the 'Cold constrictive of moisture,' which moisture by means of such constriction is forced out, and does not remain in the matter except in such a

proportion as is necessary for the continuity of the same. And this is termed by Aristotle the 'Drying and Congealing Virtue of the earth.' And this is the cause why stones cannot in any way be melted by the desiccative heat in the same manner as the metals are melted. For in metals the moisture has not been completely squeezed out, for which reason the matter of metals remains capable of fusion. For which reasons we must maintain that Heat, that digests and repels moisture, and Cold, that constringes moisture after it is acted upon by the dryness of the earth, are the peculiar instruments of the Efficient or Mineral Virtue of stones. And this is the doctrine laid down by Aristotle in his treatise 'On Minerals,' viz., that stones are produced in two ways, either by congelation or by conglutination; as already stated."

Aristotle's disciple Theophrastus has elaborated the same theory into the following compact and intelligible form:—"Of things growing within the earth, some are of Water, others of Earth. Of Water, are the metals, such as silver and gold and the rest: of Earth, are stone, and all the more precious kinds of stones, and also whatever other peculiar varieties there be of earths properly so called; peculiar, that is to say, on account of their colour, their polish, their density, or any other quality. The subject of metals has been considered elsewhere; at present let us discuss the latter substances, stones and earths.

"All these therefore, we ought, speaking generally, to consider as made up of a certain pure and homogeneous matter, produced either by a flux or a filtration through some medium, or else secreted in some different manner, as has already been stated. For it is possible that some are formed in the latter, some in the former way; others again by a different process: from the which causes in fact they derive their smoothness, their density, their brilliancy,

their transparency, and all such properties. And the more pure and homogeneous each substance may be, in so much higher a degree do the aforesaid qualities subsist in the same. For as a general rule, according to the perfection possessed by the agent employed in the composition, or the condensation, of the subject-matter, so does the product turn out of the same kind. Now condensation is in some cases the result of heat, in others of cold; for there is no reason why certain kinds of stones should not be formed by either of these causes, inasmuch as all the various kinds of earths may be supposed to be produced by fire, if indeed it be a fact that the condensation and the dissolution of any substance are brought about by opposite means. Now in stones many peculiar qualities subsist; for in the earth, their origin, lie the causes of most of their different distinctions with respect to colour, tenacity, density, smoothness, and similar properties: whilst in other respects differences between them are not commonly to be observed."

By substituting in the above-quoted theories the terms "Electric action" and "Affinity of particles" for "Efficient Virtue" and "Condensation" we really measure all the advances modern science has made in solving these mysteries of creative Nature.

Although the existence in gems of the manifold virtues of which some samples have been above cited, was received as an established truth, yet the speculators of the times were not agreed as to their source and manner of infusion into the substance. "It is indisputable," says Camillo, "that there are virtues in stones, but the origin whence such a virtue is derived has not been determined. Some lay it down that there are in stones special virtues, besides their complexional, derived from the elements composing them, and they support their assertions by the following argument alone: that whatever is composed of anything

possesses the virtue of what composes it, just as a rivalet has the taste of its fountain head. But it is a known fact that stones are composed of the elements, therefore whatever there is in stones comes entirely from the elements and not from any other virtue. Plato and his followers, who hold the doctrine of *Ideas*, say that all composite bodies, in whatever species, have their own Idea (or type) that infuses virtue into them; and in proportion as such mixed or composite bodies possess a purer substance of their own derived from the elements, in the same degree does their Idea, when it is infused into them, produce a more perfect result through the means of the same pure matter. But inasmuch as the 'Precious Stones' are of this nature, it follows that their Idea superinduces in them a greater virtue than in the case of other composite bodies that are less pure; and thus they account for the special virtues in stones by means of the Idea."

"But Hermes, and several other astronomers who have studied matters celestial, assert that all virtues of things below proceed from the planets and the constellations of heaven. And according as the composite body is made up out of purer or coarser elements, so do the stars and the constellations infuse a greater or a lesser virtue into the same. And since precious stones possess a purity of their elements, and, so to speak, almost a celestial composition or syncretism (as is apparent in the Sapphire, the Balais, and the rest), these stones have greater virtue than others not composed of equally pure elements. Wherefore Hermes saith concerning the virtue of stones: 'We should hold it for certain that the virtues of the things below all proceed from the things above; for the things above, by their substance, light, position, motion, and also figure, infuse all those remarkable virtues that be in stones.' It is therefore made out from the decisions of these philosophers, and

likewise of Ptolemy, that the virtues of stones come from the planets, stars, and constellations, through the medium of the pureness of their complexion. Other opinions might be adduced, but since they rest on no foundation we may as well pass them by, and accept at once the above-cited explanation: seeing that no other theory is so consistent with truth as that of Hermes and the other astronomers, who lay it down as established that things below are governed by the influence of things above."

"*Albertus Magnus*, who was the chief and greatest of philosophers, following the method of natural causes, pretends that the virtue of stones proceeds from the species and substantial form of the stone itself. For in every composite body there be certain things that have for their cause the properties of the elements, such as hardness, weightiness, and the like; and also there be certain things, as for instance the virtues of the same, that have for cause the species itself. To take an example, the Magnet possesses hardness, and a ferruginous colour, and other similar properties, proceeding from the virtue of its ingredients or elements; but its power of attracting iron proceeds from the species of the magnet itself; which same *species* indicates the aggregate of the material and the form. This is the opinion of the commentator on the First Book of the *Metaphysics*, where he explains that *species* is not form merely, but the entire aggregate of the matter and the form which gives its individual being unto the same matter. For the being (essence) of all things, according to its own species, has its proper operation and goodness according to the species in which it is formed and perfected in its natural being."

"But the form that gives the species to the matter is more powerful than the other forms; although frequently, from the indisposition of the matter to receive it, this form

shews itself but little, and produces little effect. Wherefore Hermes 'On Stones' hath that 'stones of the same species vary in power in consequence of the confusion of the matter, and even of the place of their generation, by reason of the directness or the obliquity of the rays that strike together upon these places—and this to such a degree that frequently no effect proper to the species is induced.' Wherefore, considering the matter philosophically and upon the authority of Albertus Magnus, let us declare that the virtues of stones proceed from the species through the means of the substantial form of the particular stone when generated in a place suitable, and of matter apportioned, befitting the essence of the stone." As a specimen of the arguments by which these notions were upheld, the following extract will serve the purpose admirably:—"In the first place experience militates against these objectors, inasmuch as we see with our own eyes a virtue subsisting in stones. Do we not see the Magnet attract iron; and the Lapis-lazuli cure the carbuncle and similar diseases in many people? The man would not be of sound mind who should deny such facts, since they are established with us as first principles. Moreover I will use an argument against objectors derived from the common proverb, 'the report that all people spread is not entirely empty.' Now, as report both amongst some of the ancients and all of the moderns has ever declared that virtues do subsist in stones, we must therefore believe doctors that virtues do subsist in stones. The authority of *Solomon* also is of great weight in this matter where he says, 'Divers are the virtues of stones: some give favour in the sight of lords; some protect against fire; others make people beloved; others give wisdom; some render men invisible; others repel lightning; some baffle poisons; some protect, and augment treasures. Others cause that husbands should love their

wives; some appease storms at sea; others heal sicknesses; others preserve the head and the eyes.' And to sum up all, whatever benefit can be thought of for mankind, the same can be brought about through the virtue of stones. It must however be understood that in stones there is sometimes a single virtue, sometimes two, three, or several; and these virtues do not subsist in consequence of the beauty of the stone, for some of the most efficacious stones are extremely ugly and yet possess very great virtue; whereas others are very beautiful and yet possess no virtue at all. On which grounds it is held amongst the most famous doctors as an indubitable and established truth, that virtues subsist in stones, as they do in other things, but as to the manner in which they subsist, there is a diversity of opinion. One theory is that of the Pythagoreans, who hold that virtues subsist in all things, and proceed from a *soul*; and maintain that stones as well as all inferior things are endowed with souls. They pretend also that souls can enter, and can leave a different substance by means of the soul's operations, in the same manner as the human intellect extends itself to the objects of the understanding, and the imagination to the objects of the imagination. Thus, with respect to stones, they hold that the souls of the stones extend themselves to man by means of the proximity of the particular stone; and so impress their peculiar virtues upon the substance of the man: and they explain that the virtue in stones is operative through the means of the soul, in the same way as fascination takes place from the glance of the eye, through the means of the soul. They assert that it is through the *sight* that the soul of a man or of another animal enters into a man or another animal and affects the action of that animal; which same fascination, or "stroke" is believed to come not from the sight only, inasmuch as the act of sight takes place by receiving im-

pressions, not by sending them out. Of the same opinion Virgil seems to be in his *Bucolics*, where he has—

‘Some evil-eye hath struck my tender lambs.’

Such a power of fascination exists not only in man, but in brutes likewise, as Solinus avers, and Pliny also; and as I have experienced in my own case, that when our wolves in Italy are the first to see a man, that man’s voice becomes hoarse, neither is he able to call out in any other voice, although previously he had no defect in his vocal organs. Nor does this happen by means of the sight only, but, as above declared, from another cause, namely the soul of the agent giving the stroke. And this opinion was accepted by Democritus, who asserted that all things were full of gods; and by Orpheus likewise, who said that gods were diffused through all things, and that God was nothing else than that which forms all things and is diffused in all things. In this sense, therefore, they believed that souls are gods; and they attributed virtue to things, through the operation of the soul.” (*Cam. Leonardi*, ii. 2.)

The theory by which he explains the origin of the “nature-paintings” in figured Agates, is so characteristic of the philosophy of the times that it deserves quotation here. “Albertus Magnus, Henry of Saxony, and many other philosophers, cite instances, and prove that occasionally there is so great a special power of the constellations in producing or in giving shape to certain things, that these are produced not merely in their proper species but also in others of a different kind: even things that appear impossible, as is evident from the instances they quote. But at the fact they themselves are not surprised, inasmuch as they understand its cause; for all wonder is the offspring of ignorance. For they maintain that so

strong occasionally is the force of the influence of the heavens from the aspect of the planets and constellations, and from the positions of the same, that from human seed are generated not merely human beings, but beasts and members of beasts are frequently engendered out of the same. And in the same way in which this happens in the case of things animate, it may happen likewise in the case of stones, and other inanimate bodies. It would be ridiculous to suppose, that is for reasonable people, that Satyrs, Centaurs, and such like monsters, would be engendered from a sexual intercourse between man and beast, and yet we have often seen monsters of the sort given birth to by women, whilst it is not to be believed that similar animals were the fathers of them: but as we have said, these and even greater prodigies are brought about by that influence of the heavens."



ADAMAS: 'Αδάμας: *Diamond.*

By this name the earliest Grecian writers did not understand a precious stone, but rather some metal of invincible hardness such as steel, when compared with the more ancient instruments of bronze. Such must have been the "adamantine chains" in which Æschylus pictures his Prometheus bound, the legend about his iron finger-ring, memorial of his torture,* sufficiently attesting what had been the material of these bonds. In process of time, as the sphere of the arts widened, this epithet seems to have been transferred to certain gems more refractory to the engraver than the Sardis and Agates generally worked upon by him. Theophrastus does not include the Adamas in his list of gems, and only once incidentally alludes to it (19) as an incombustible substance; probably a stone, since the passage treats of the various sorts of the Anthrax. The first indisputable mention of the Adamas as the true Diamond, containing its most striking characters, minute size, and enormous value, is met with in Manilius (iv. 926)—

"Sic Adamas punctum lapidis, pretiosior auro."

And this poet flourished in the latter part of the Augustan age. All this fully bears out Pliny's assertion that the

* "Post hunc consequitur sollerti corde Prometheus
Extenuata gerens veteris vestigia pœne,
Quam quondam silici restrictus membra catena
Persolvit pendens e verticibus præruptis."

CATULL. *Nupt. Pœl.* 298.

Adamas, "bearing the highest value not merely amongst gems, but amongst all human possessions, was long known to none but kings, and to but a very few of *them*." Indeed it could not have been known at all in Europe before a direct intercourse with the nations of Southern India had been brought about by the establishment of a Macedonian kingdom in Bactria. Certain it is that Theophrastus could not by mere oversight have omitted it from his list of gems, if known to his contemporaries, for the above-quoted passage from Pliny clearly proves that the Diamond, as soon as introduced to the knowledge of the ancients (for his "*regibus*" necessarily signifies Greek princes), took the same foremost place amongst precious stones that it has ever since maintained.

Pliny thus gives the *ancient* notion as to the nature of the Adamas (xxxvii. 15), "*Ita appellatur auri nodus* (the germ of Gold), *in metallis repertus perquam raro, comes auro, nec nisi in auro nasci videbatur.*" Here he evidently alludes to the passage in Plato's '*Timæus*' (59, B), describing the origin of metals by infiltration and condensation, the theory afterwards adopted by Theophrastus: *τούτων δὲ πάντων ὅσα χυτὰ προσείπομεν ὕδατα, τὸ μὲν ἐκ λεπτοτάτων καὶ ὑμαλοτάτων πυκνότερον γιγνόμενον μονοειδὲς γένος, στίλβοντι καὶ ξανθῷ χρώματι κοινωθέν τιμαλφέστατον χρῆμα, χρυσὸς ἡθημένος διὰ πέτρας ἐπάγει. Χρυσοῦ δὲ ὁξὺς διὰ πυκνότητα σκληρότατον ἐν καὶ μελανθὲν, Ἀδάμας ἐκλήθη.* ("Of all these elements, designated by us liquids in a state of flux, that from the finest and most homogeneous particles becoming the most condensed was solidified into a special kind distinguished by its shining and yellow colour, that most precious thing gold, after filtering through the pores of the rock; whilst the *germ of the gold*, excessively hardened and dark-coloured by reason of its density, has been termed the *Adamas*.") The epithet *μελανθὲν*, "dyed a dark blue,"

sufficiently indicates that Plato understood nothing more than our Sapphire by his Adamas, Theophrastus using the same term to designate the colour of the Occidental Turquois.*

The theory of the Oriental philosophers upon this subject is thus elegantly condensed in the tetrastich of Akbar's poet laureate, Sheikh Fizee, which formed the legend on the obverse of the chief gold piece:—

"The sun from whom the seven seas obtain pearls,
The black stone from his rays obtains the jewel;
The mine from the correcting influence of his beams obtains gold;
And the gold is ennobled by the impression of Shah Akbar."

It is interesting to confront the latest modern with this the most ancient explanation of the method pursued by Nature in producing the Diamond. Prof. Maskeleyne remarks: "Of the numerous solutions of this problem one possesses peculiar interest, viz., that considering Diamonds as deposits on the cooling of fused metals (or other substances) surcharged with carbon.

"Graphite, boron, and silicon are formed on the cooling of fused aluminium surcharged with these elements; and the same elements—in other respects so closely grouped with carbon—separate in the adamantine form seen under analogous circumstances. The latter are crystallized indeed in different systems from Diamond, but they possess many of its characters in a remarkable degree."

* The Adamas of Theophrastus may have been the Emery-stone. There is an analogy in the word *Samir*, of which the Rabbinical legend is told that with the blood of the worm so called, Moses engraved the Stones of the Rationale; whilst others render *Samir* by *Adamas*. Now there can be no doubt that *Samir* and *Smiris* are forms of the same (Persian) word. The regular Hebrew name for the Diamond is *Jahalom*, derived from *halam*, "to smite," and denoting its power to overcome and cut all other gems. The name is therefore a mere epithet, equally applicable to the Corundum.

Some mineralogists have advanced the paradox that the *Adamas* of the *Romans* also was not the Diamond, but the Sapphire. A sufficient answer to this is, that such large Sapphires as the ancients frequently engraved (the signet of Constantius, for instance weighing 53 carats) could not be termed "*punctum lapidis*:" and besides this, the latter stone could not have been engraved by means of its own fragments. The Sapphire, too, usually occurs in masses of considerable relative size, especially the grey sort, supposed, according to this theory, to represent the *Adamas*, and these are mostly found rounded and pebble-shaped; of a form, in short, to be described by anything better than the term "*punctum*."

It is, however, impossible to mistake Pliny's true meaning, especially if a little attention be paid to his admirably chosen comparisons exemplifying the characters of the gem. "The Indian appeared to have a certain affinity to Crystal, being colourless and transparent, having six angles, polished faces, and terminating like a pyramid in a sharp point (*laterum sexangulo lævare turbinatus in mucronem*); or also pointed at the opposite extremities, as though two whipping-tops* (*turbines*) were joined together by their broadest ends." A wonderfully compact summary this of the distinctive features of the Diamond, for the "six angles" can only belong to an octahedron, the primary form of its crystallisation; the "two pyramids joined together by their bases" expressing the case where the octahedron is perfect; and the "natural polish" marking those small Diamonds, perfectly crystallised, called "*Naifes*" by the Indians, completes the picture. These Indian stones, the largest known to the Romans, attained

* The ancient shape of this toy was a many-sided pyramid, inverted.

the "size of a hazel-nut *kernel*," or about 3 carats' weight.* This comparison was not selected at random; it is more full of meaning than at first sight appears, and affords the aptest possible illustration of the idea. Pliny's "*nux avellana*," the *noccinolo* of the Italians (so called to distinguish it from the *nux* proper *noces*, a walnut), is the kind known in England as the Barcelona nut, the kernel of which, as every one must remember, is of an obtusely conical form, precisely that assumed by the Diamond in its secondary shape, when the edges of its faces are converted into flat planes. Nothing could be more appropriate than this simile to convey to his reader's mind the exact appearance of the antique Diamond, as worn by the enviable possessor (the finishing touch to his magnificence), with its base embedded in the massy gold of the ring. The *Lasque*, thin, flat, and oval, where all the angles have disappeared, is evidently his Ethiopian, "the size of a gourd-seed, and of a somewhat similar colour,"—a pale yellow. This, it is especially remarked, was the *only* kind known to the earlier mineralogists consulted by Pliny, and was said to be found near Meroe in Ethiopia: but Ethiopia was a vague term for the remotest East, and the Egyptian Meroe was confounded with Mount Meru in Hindostan.

* Why the Romans could obtain no larger stones is explained by M. Ben Mansur's noticing that in India, where the Diamond is greatly sought after, its exportation was formerly prohibited. This embargo probably only applied to stones above a certain weight, for we find, from Gar. ab Herto, that all stones obtained in the washings above 30 mangelis (37½ carats) were claimed by the sovereign, and the secession of such punished by the confiscation of all the offender's property. And De Laet (1647) says that the old mines of Golconda (then stopped working) used to be let on lease, with the reservation of all stones above 10 carats for the king; and what is still more to the purpose, Tavernier mentions that, prior to the discovery of the Coudour mine, in the middle of the sixteenth century, the largest Diamonds ever seen were at most of from 10 to 12 carats' weight.

The Macedonian found in the gold-mines of Philippi was also a Lasque (*cucumis semini par*). The Arabian resembled the Indian in all respects, but was smaller. The Androdamas had a silvery lustre, like the Adamas, but was always square, and resembled a *die* in shape. Here we have the cubic crystal, the faces of which are never polished, but covered by a semi-opaque striated varnish. Lastly, the "Cenchros," described as like a millet-seed, denotes the spherical, an abnormal form where the crystallisation radiates from the centre, preventing all artificial polish, and for that very reason designated *Bort* (Bastard, in Provençal), from *Abortus*.*

Of the six kinds into which Pliny divides the Adamas the four above described are doubtless all forms of the true Diamond. The minute size is enough to demonstrate this; for how else could inconspicuous stones have been so highly valued—stones, too, whose minuteness can only be exemplified by the comparison to a gourd-seed or a grain of millet? But, besides these, two kinds remain, rejected by Pliny himself as "degenerate, and possessing nothing of the Adamas but the honour of the name." These were, the "*Cyprian*, of a bluish tinge (*vergens in aërium colorem*), most valuable as an amulet, and the *Siderites* of a steely splendour, and exceeding all the others in *weight*." Both these were Sapphires, as their blue or grey colour and greater specific gravity prove, coupled with the remark that both could be drilled by means of another diamond, *i. e.* a true one. It is a singular coincidence that Epiphanius (a Cyprian bishop, by the

* Pliny's *Chalazias*, "of the form and colour of a hailstone, but as hard as the Adamas, and which retained its coldness even in the midst of fire," must have been the cubic form with the edges rounded off. No other comparison could so exactly represent this modification of the crystal—its irregular surface, and its icy colour, obscurely white.

bye) describes the Adamas as of a sky colour (*ἀσπερίτης*). This, according to him, formed the "Declaration" or Urim and Thummim worn over the high priest's breast-plate; "the change in the colour of which, when he came out from the sanctuary, manifested the favour or anger of Jehovah." Certain stones were used in jewelry a century ago under the name of "Diamonds of Baffa" (Paphos), but the remembrance of what they really were is now entirely lost in the trade; some conjecturing them to have been Jargoons,* others only quartz-crystal. Lessing, however, was inclined to consider them as something more akin to the real stone than either of these. But I have at last discovered that the "Paphian Diamonds" are yet commonly used in the Levant for necklaces, and are no more than the rock-crystal of Baffo.

Pliny remarks that the Diamond is the companion of gold, and seems only to be produced in gold itself. He is here correct, though perhaps it may be but by an accidental coincidence; for all the Diamond-mines, the discovery of which is recorded, have been brought to light in pursuit of alluvial gold-washings. This was notably the case with the oldest in the Serra do Frio, Brazil, and the most productive in the world. Australian "diggins" have already furnished a few, and will probably yield a vast supply when their gravel comes to be turned over by people having eyes for other objects than nuggets and gold-flakes.† The British Museum, amongst

* The Cingalese still call the Jargoons "Diamonds of Mataura," from the place where they most abound.

† In the Exhibition held at Paris (1856) two Diamonds were to be seen, found in the Macquarie River. My anticipation in the text has begun to be verified in the Exhibition of Native Productions, held at Melbourne, May, 1865. The feature that excited the greatest interest were the numerous specimens (small, it is true, but undeniable) of the Diamond from various parts of the colony.

the native Diamonds, exhibits an octahedral Diamond attached to alluvial gold; and, strange confirmation of the ancient idea as their affinity, not only is the primary crystal of that metal also the octahedron, but all its secondary modifications exactly correspond with those of the Diamond. Modern science has made no further advance towards the solution of this problem beyond that propounded as a certainty in the ancient 'Timæus.' Prof. Maskeleyne observes: "Gold seems in every diamond-country to be either the associate or the not distant neighbour of the Diamond. In the Diamond, splinters of ferruginous quartz have been found. A high antiquity, and an origin perhaps contemporaneous and not improbably connected with the geological distribution of gold in quartz-veins may be inferred from these facts." "In Brazil it has been traced to its rock-home in the *Itacolumite* (a micaceous quartzose schist often containing talcose minerals, and intersected by quartz-veins) and also in a hornblende, also continuous with the *Itacolumite*. But whether these are the parent rocks—or whether, as they are probably metamorphic in nature—its origin comes from an earlier state of the materials that have been transmuted by time and the play of chemical and physical forces into *Itacolumite* and hornblende slate, we are not in a position to declare."

The Romans, taught by the Indians no doubt, valued this gem entirely on account of its supernatural virtues. Pliny,

A writer in the 'Times' (April 5, 1866) quotes a letter from a correspondent at the Woolshed diggings, Ovens district, mentioning that he had examined no less than 80 Diamonds found in that single locality. They were all minute, varying from half-a-grain up to two grains. Some were of a fine yellow water. The largest he had been able to procure weighed two carats, and this he sent to the London Exhibition of 1862. But from accounts that had reached him he had good reason to suspect that specimens of much greater weight had previously been thrown away by their ignorant finders.

and this time without his usual sneer at the Magi, says that it baffles poison, keeps off insanity, and dispels vain fears, and hence takes its title of Anachites.* The mediæval Italians believed all this and much more: they entitled it "*Pietra della Reconciliazione*," because it maintained concord between husband and wife. On this account it was long held the appropriate stone for setting in the espousal-ring. It was not recommended to them by its beauty, for, with the rare exceptions of the "*Naïfes*," the surface of the best is coated by a dull greenish varnish; so that, strange antithesis to our ideas where the Diamond is the type of light and lustre, Isidorus speaks of the Indian Diamond as being a little stone, and devoid of beauty, "*lapis parvus atque indecorus*." Never attempting to polish, even in the same inartificial manner as their other hard gems, much less to engrave upon it—for which the minuteness of the specimens known to them unfitted it—the Romans wore the crystals in their native form. A magnificent example is afforded by the clasp of Charlemagne's mantle, set with four large stones, the legacy doubtless of his imperial predecessors.

Although Diamonds have played an important part amongst the machinery of modern history, yet the only one that makes any figure in ancient is Nerva's, which he

* He here seems to have Orpheus in view (190), "a stone full of wondrous milk—whence the ancients have termed it the Anaktites Adamas, because it bends the minds of the gods, so that they respect their offerings and take pity upon mortals. They have likewise called it Lathæan, because it prevents both mortals and immortals from thinking of their sorrows and evils. Others bid us call it the Galactites, for, if one rubs it, a liquor exactly like milk exudes therefrom." Pliny's *Galactites*, however, was a soft stone, brought from the Nile, tasting like milk, and melting in the mouth. But, adds he, some gave this name to an Emerald surrounded by three white lines. The former must have been the pure carbonate of lime, the Berg-Milch of the Germans.

afterwards gave to Trajan on appointing him his colleague, and with which the latter some years later rewarded the eminent services of Hadrian in the second Dacian War, as Spartan records, thereby tacitly acknowledging him for his successor in the Empire.

A few rings also have come down intact to our times, which show what was the appearance of this of Nerva's, or of the one set with the

"Adamas notissimus et Beryllus
In digito factus pretiosior,"

that doubtless had flashed in St. Paul's eyes on the momentous audience before the Jewish queen and her too-loving brother in their "great pomp," and which afterwards, a *souvenir* of Titus, graced the finger of the imperious lady in Juvenal's days. The Hertz Collection possessed a well-formed octahedral Diamond, about a carat in weight, set open in a Roman ring of unquestionable authenticity. The Waterton Dactylitheca, in its almost unlimited extent, comprising the rings of all nations and ages, furnishes a yet finer example of the Diamond in its original setting; a ring of a singular fashion, apparently dating from the Lower Empire, for the head is much thrown up, and has the sides pierced into a pattern, the "*opus interrasile*," so greatly in vogue during those times. It is set with two diamonds of (judging by the eye) a carat each; one a perfect octahedron of considerable lustre, the other duller and irregularly crystallised. Another such example might be sought for in vain throughout the largest cabinets in Europe.

The Romans in their estimation of this gem were guided by the Indians, who have ever given it the first rank amongst jewels; the Persians, however, in the thirteenth century, placed it fifth; after the Pearl, Ruby,

Emerald, and Chrysolite. Cellini ranks it in his Table of Values after the Ruby and the Emerald, and only at the eighth of the price of the former. Garcias ab Horta writes in 1565, "The Diamond is considered the king of gems, on account of the hardness of its substance; for if we look to *value* and beauty, the Emerald holds the first place, and the Ruby (if clear) the next."

Pliny retails a "jewellers' story," as to the infrangibility of the Diamond, which was only to be overcome by first steeping it in goat's blood; and thereanent indulges in certain profound reflections upon the doctrine of Antipathies: adding that such a discovery could never have been guessed by mere mortal ingenuity, but must have been the express revelation of Heaven. Ben Mansur also gravely states that a Diamond laid upon an anvil, and struck with a hammer, instead of breaking, is driven into the anvil; and that the only resource* is to wrap it up in lead, and then to hammer it, or else enclose it in wax or turpentine; expedients in reality resorted to, as one can well suppose, but only in order to prevent the precious splinters from flying about and being lost.

This infrangibility was naturally in people's minds the concomitant idea with that of the hardness already ascertained: this, and resistance to violence, being considered as inseparable; and besides, the experiment was too costly to be ever tried. But in reality this gem being composed of infinitely thin laminæ deposited over each other in a direction parallel to the faces of the primitive crystal, it can easily be split by a blow of a knife in the direction of these laminæ. This property had been discovered long ago, even in the sixteenth century, but then passed for the mere chimera of a visionary, for De Boot says that he knew a physician who "boasted that he by

a singular artifice could stick a Diamond upon the point of a needle; and moreover, without the aid of any instrument or material, other than those furnished by the human body, divide it into fine scales like a piece of talc:" a comparison which attests the truth of his boast. The arcanum, however, like many other valuable mediæval recipes, died with the discoverer, until Dr. Wollaston again hit upon it, and made thereby some profitable speculations by purchasing large Diamonds at a low price which had been rejected by the jewellers on account of their bad shape and fulness of flaws, and skilfully subdividing them into smaller and perfect crystals. The learned chemist's discovery had, however, been long anticipated by the Indian lapidaries, like most other secrets in this branch of science. 'Tavernier accounts for the prevalence of "thin stones" (tables) at the Raolconda mine, by the fact that the Diamonds got flawed from the miners breaking the rocks containing the veins of sand, their matrix, by violent blows of iron crowes—"and when they see that the flawed stone is of good size, they set to work to *cliver*, that is, to split it, at which they are much more expert than ourselves."—(ii. 327.)

It will naturally be asked why the ancients should have ever desired to reduce to fragments so rare a possession: but Pliny supplies a sufficient motive: "When by good luck they succeed in breaking the stone, it flies into such small scales (*crustæ*) that they are scarcely visible. These are in request with gem-engravers, and are mounted in iron tools,* there being no substance so hard that they

* An invention of the remotest antiquity. "The sin of Judah is written with a pen of iron, and with the point of a diamond; it is graven on the table of their hearts" (Jer. xvii. 1)—aptly rendered by the Vulgate, "*stylo ferreo in ungue adamantino.*" But the *Adamas* of the Babylonians and Egyptians must have been the *Corundum*.

Flavio

cannot hollow out with the greatest ease." We must, however, suppose that they used for this purpose only the Lasque and the Bort, stones of an ugly form, and too dull to serve as ornaments; just as in our day these same kinds are pounded up to make the diamond-dust for lapidaries. The Romans, however, did not employ the crushed stone in the form of diamond-powder, but the sharp fragments were mounted singly in an iron handle, and managed much in the same manner as the graver in cutting a design on steel; hence the great freedom of touch characterising true antique work on gems, where the artist has evidently cut away the material with an instrument obstructed by no resistance. Natter, himself one of the most distinguished gem-engravers of the last century, justly particularizes the predominant use of the diamond-point in an intaglio as the grand criterion that distinguishes the antique from the modern. The ancient artist having sunk his design into the gem to the depth required by the means of a blunt drill charged with emery-powder, put in all the finishing strokes, the features, the hair, the drapery, with his keen diamond-point; the modern executes the same work in a tamer, more mechanical manner, with the edge of a rapidly revolving disk or the point of a drill, made cutting by a coat of diamond-powder and oil, and turned like a lathe by a fly-wheel, whence the name of the machine. Before the introduction of the true Diamond into Greece, sharp fragments of Corundum obtained from Naxos served the same purpose: the name Adamas was then doubtless confined to the blue and grey Sapphires found in Cyprus, or to the opaquer crystals of Corundum discovered in the

Flavio Serletti, of Livorno, soon after the year 1700, is believed to have been the first to revive (at Stosch's suggestion) the use of this ancient instrument, and by its aid to have rivalled and counterfeited the greatest masters of antiquity. (*Giulianelli*.)

emery-mines. Such a stone reduced to sharp fragments would serve to cut into and excise the Quartz gems, Sardis, Agates, Jaspers, then in request as signets, with almost as much facility as the Diamond itself. In fact, the amorphous Corundum, used from time immemorial by the Indian lapidaries for cutting the hardest gems, was known when introduced into the European atelier, some ninety years ago, by the name of *Adamantine Spar*. That some such mineral must then have represented the *Adamas* is a necessary consequence from the patent fact that works apparently executed entirely by the diamond-point and others with but little assistance from the drill, belong for the most part to the archaic period of Greek art, some ages before the true Diamond could have found its way thither from India. Similarly within the last few years the diamond-powder itself has been superseded in Paris by the *Carbénado*, a black substance of the same chemical nature, but found in Brazil much more abundantly, the masses attaining to 1000 carats in weight. This new agent, besides being employed in powder, is fashioned with shell-lac* into a kind of graver (burin) of power to act most efficaciously upon the hardest gems.

We find in the ancients few indications as to the particular locality of India that supplied them with the Diamond; Pliny says merely, at random, "the gem-producing rivers are the Acesines (Jenoub) and the Gauges." Dionysius Periegetes enumerates the Diamond amongst the numerous gems (the Beryl, Green Jasper, Topazius, Amethyst) picked up in the river-beds by the natives of India, as anciently understood, lying to the east of Mount Paropamisus and Ariana. Ammian (xxii. 8, 30), writing in the fourth century, mentions the region of the Agathyrsi, situated beyond the Sea of Azov, as abounding in Diamonds: "*apud quos adamantis est copia lapidis.*" He

may refer to the gold-washings in the Ural Mountains, true seat in former ages of the fabulous Arimaspi. There is actually a false Diamond found plentifully in Siberia, the use of which is interdicted to the Russian jewellers under the heaviest penalties, as I have been informed by a person of that profession, formerly practising at St. Petersburg. It cannot be distinguished by the eye from the true gem. The 'Periplus of the Red Sea' has merely, "To Barace are brought various and numerous kinds of lustrous gems, the *Adamas*, the *Hyacinthus*, &c.," but no mention of the actual situation of the mines. All that the usually well-informed Ben Mansur knew of the Indian Diamond mines was the fable that "in the Eastern part of India there is a deep valley inhabited by serpents,* where the Diamond is produced; but some believe it to be gotten in the mines of the Jacut (Ruby)."

The earliest authentic account of them is to be found in the little treatise '*De Arom. et Simp. Historia*,' written in Portuguese by Garcias ab Horto, in 1565, in the form of dialogues; a Latin abridgment of which was published by Clusius two years later, as a supplement to Monardes' treatise on the same subject. This writer had been physician to the Viceroy at Goa, and had occasionally been called in by the Nizam-molucco (ul-Mulk), ruler of the Deccan, who had offered him 40,000 pardaost† a year to reside permanently at his court. His account represents in all probability pretty nearly the same state of things as

* This in its origin is the same story as that reported by Sotacus concerning the *Dracontia*, found in the serpent's brain, *colourless* and transparent (*candore translucido*), and admitting of no *further* polish or improvement from art. Sotacus had himself beheld this gem on the hand of "the King;" and being quoted "as a most ancient author," probably gives us here the first notice of the true Diamond.

† A coin current at Goa, equal to half-a-crown English; the same as the early native rupee.

when the Roman traders from Alexandria made their annual voyages to Barochie upon that coast. "Diamonds are found in only three or four places. In the province of Bismagar there are two or three rocks that produce them; which brings in immense gain to the king of that country, as every stone above the weight of 90 mangelis (150 grains, the mangeli of Goa being 5 grains French according to Tavernier) belongs to the sovereign. There is another rock in the Deccan, not far from the territory of the Imadixa (Imad-shah), or Imad-molucco, but within the lands of a certain native prince, which produces excellent Diamonds, though of smaller size. These are the stones known by the name of 'Diamonds of the Old Rock,' and are brought for sale to Lispor, a town of the Deccan, where there is a noted fair held. The Guzerat merchants buy them there, and bring them to us at this place (Goa). They even carry them as far as Bismagar, tempted by the great profit. For these stones, naturally polished and called 'Naifes' by the Indians, are infinitely preferred to any others. There is another rock on the sea of Tanjan, in the Malacca country, which yields Diamonds, also called 'Diamonds of the Old Rock,' of small size but fine quality. One fault they have, they are very heavy, which makes them more liked by the sellers than by the buyers."

The same careful investigator of Indian productions notes Pliny's assertion about Diamonds being found in Arabia as altogether unfounded. But there is little doubt that the Sabaeans of South Arabia were a Hindoo race, there settled for purposes of traffic, like the Banian merchants, who nearly engrossed all the trade in precious stones in Tavernier's age. These obtained gems of all kinds from India itself, and, pursuing their business, passed over incredible distances; and were to be found domiciled in places where they were least to be looked for.

"It seems to me," says Garcias, "quite a miracle how these gems, which might be expected to be produced in the deepest bowels of the earth, and in a space of many years, should on the contrary be generated almost on the surface of the ground, and come to perfection in an interval of two or three years. For in the mines, this year for instance, at the depth of a cubit, you will dig and find Diamonds: let two years pass, and mining in the same place you will again find Diamonds. But it is agreed that the largest * are only found under the bottom of the rock." De Laet in 1647, after quoting the above with a few explanatory remarks, adds: "But in former years, as I have been informed by some English merchants, the richest mines were at Golconda, on the gulf of the Ganges, about 108 miles from Masilipatam. These used to be farmed out for 300,000 pagodas per annum (150,000*l.*), with the reservation of all stones above ten carats weight, for the royal treasury. But these works were stopped by the king's order in 1532, either through fear the stones should become too common and cheap, or, as others say, because the Great Mogul† had demanded an annual tribute from the king of Golconda of three pounds by weight of the finest stones found. The most likely reason, however, is, that the mines

* The largest Garcias had seen, himself, weighed 140 mangelis (175 car.); the next to this 120 mangelis (150 car.); but a credible person had informed him that he had seen one at Bisanagar as large as a small hen's egg. It is quite unaccountable why De Boot should quote the first mentioned as of 187½ car., citing Monardes instead of Garcias, (A mistake readily fallen into, the treatises of both having been published together in the same volume.) It seems as if he had heard of the Koh-i-noor; it being scarcely probable that two stones should be co-existent of that extraordinary weight—agreeing within one carat and a half, even which discrepancy may be accounted for by the small variation, of $\frac{1}{100}$, between the Portuguese carat and the French. Garcias' grains are wheat, not troy grains.

† Baber had founded the Mogul Empire in the years 1526-8.

were already worked out. An Englishman, William Methold, says that he had visited these mines at the time that they employed some 30,000 labourers, some in digging, some in bailing out the water by hand, having no mechanical contrivances for that purpose. They sunk shafts 10 or 12 fathoms deep, and carried out the earth, which was red, mixed with white and yellow chalk, to a place levelled to receive it: and when dried by the sun broke it small and sifted it. Sometimes, though very rarely, they obtained stones of from 120 to 200 carats; many of from 10 to 15 carats; but by far the largest number so excessively minute, that from eight to twenty of them put together would only weigh a single carat." The mine of Gani, or Coulour, the most productive of all at the date of Tavernier's visit (1642), had been discovered about a century before by accident. A poor man breaking up a bit of waste ground to sow millet, picked up a "pointe naïve" weighing nearly 25 carats. Thinking it something extraordinary he carried it to the town of Golconda, and showed it to a jeweller, who immediately acted upon the intelligence. This mine yielded abundance of stones from 10 to 40 carats weight, and often of much greater; for example, that of Mirginola's (ii. 339).

India now sends no Diamonds to the market; but a few, and of the best quality, still come from Borneo. Lowe (Sarawak) states that some have been found at Sarawak; but the mines now worked are at Landak, Sangoar, and Benjarnain, which produce stones of small size but of fine water, and occasionally up to 12 and 13 carats in weight.

Africa is reckoned by Pliny amongst the diamond-yielding countries; and his assertion has been lately verified. In 1840 M. Héricart de Thury announced to the Académie des Sciences that Diamonds had been found in the River Goumal, province of Constantine, mingled with

the gold-dust brought down by the stream. One specimen, weighing 3 carats, was bought for the École des Mines, Paris; another of 5 grains for the Musée de l'Histoire Naturelle; the third by the Marquis de Drée.

Similarly modern research has confirmed Ammian's notice of the abundance of Diamonds in the region of the Agathyrsi. In the gold mine of Adolph, Siberia, between 1830 and 1833, were found upwards of fifty Diamonds, octahedrons and dodecahedrons; one of considerable size, the rest from 1 to 3 grains in weight. This mine lies on the bank of the Biserek, a brook flowing into the Kama to the west of the Ural, in the government of Perm. The alluvial deposit containing them is of the same nature as that in the Brazilian workings, being a ferruginous clay mixed with a bright red sand, together with quartz crystals, iron-oxide, prases and calcedonies, and black dolomite.

The mines of the Sierra do Frio, Brazil, have ever since their opening in the year 1727 supplied the world, and are computed to have yielded in that space of time the incredible quantity of over *two tons* of this precious article. The Dutch, who previously had the monopoly of the Indian trade, endeavoured at first to discredit the Brazilian stones as spurious, so that it became necessary to send them to India and re-export them to Europe in order to give them a character.* Such was the productiveness of the mines on their first discovery, that in 1732, 1146 ounces of Diamonds were shipped at Rio for Lisbon. In consequence of this influx the price dropped at once down to a louis (18s.) the carat. Great was the consternation amongst all possessors

* In July, 1863, the Bank of Lisbon sold to the amount of 1,800,000 francs of rough Diamonds out of the Collection brought back from Brazil by John VI. in 1821. M. Bernard, of the Imperial Diamond-cutting Establishment, Paris, bought four lots for 1,500,000 fr. (60,000*l.*). There yet remain to the Portuguese Crown rough Diamonds valued at 35,000,000 fr. (1,400,000*l.*).

of old Diamonds; but the panic was speedily stayed by the Government making the working of the mines a royal monopoly, and farming out their produce to a single merchant so as to regulate the supply.

To maintain the value of the Indian stones the trade (then chiefly Dutch) set to work to persuade the public that the new comers into the market were a spurious kind, in fact no true Diamonds at all. As late as 1750 Jeffries gravely asserts the same thing, though it is hardly possible he was not aware of its falsity. Amongst other methods resorted to by those in the opposite interest to establish the reputation of the thus vilified Brazilian species, Caire mentions one repeated to him by an ancient Venetian lapidary, able to remember so far back, which was the cutting the new stones after Indian patterns, so as to make them pass for old Golconda *tables*.

The yield of the Brazilian washings stood at a pretty regular average of 30,000 carats (not quite 26 lbs. troy), until 1843, when the discovery of the Sincora mine in Bahia multiplied it *twenty-fold*. But this increase that had so alarmed all possessors of diamonds only lasted two years; the mortality amongst the workers there, owing to the malaria and the difficulty of getting provisions, speedily putting a stop to the enterprise. In 1851 the yield had declined to 150,000 carats, and still keeps falling off. The Brazilian stones run very much smaller than those formerly yielded by the Indian workings; out of 10,000 found in the Jaquintonita, the oldest and richest in Brazil, 8000 are under one carat, and only two or three from 17 to 20 carats. Of the entire year's produce of all the mines put together, it is seldom that a single one exceeds 30 carats. The slave fortunate enough to find one of $17\frac{1}{2}$ carats obtains his freedom, a permission to work on his own account, and a new suit of clothes. In the year 1851 unusual prizes

turned up in this lottery, in the shape of three stones of 120 $\frac{1}{2}$, 107, 87 $\frac{1}{2}$ carats respectively. The largest *indubitable* stone ever yielded by Brazil is the 'Star of the South,' weighing as found 254 carats. The diamond-producing tract of country extends from Itambe, in the Minas Geraes, to Sincora on the River Paraguaes, Bahia, or between 20° 19' and 13° of south latitude. The washings are carried on in the beds of the numerous rivulets supplying the streams of the rivers Doce, Arasasky, Jaquitonita, and San Francesco. During the dry season which lasts from April to October, these rivulets are diverted from their courses, and the gravel—*cascalhao*—filling their beds, is dug out down to the rock to a depth varying from 6 to 20 feet, and stored up by the side of the washing-sheds, to be examined during the rainy season. It is then washed in troughs, about half-a-hundredweight being operated upon at one time in each trough: a stream of water is turned in upon the gravel, which is stirred until the water runs off perfectly clear, when the fine gravel remaining is carefully searched for the Diamonds. Until lately the Diamond had never been traced to its matrix, but this has now been done, in at least two instances in Brazil. The writer above quoted says: "The first was in 1839, and the rock which contained it was described by M. P. Chasseau ('Bull. de l'Acad. Royale, Bruxelles,' viii. 331) as *grès psammite*, a sort of sandy freestone, the locality being the Serro di Santantonio di Grammagoa. The discoverers of the deposit took from it many Diamonds, as the rock was soft; but deeper, it became harder, and consequently more difficult to work. As many as 2000 persons from all parts came to the place; but they dug without order or plan, and, undermining the rock, part of it fell down. They still draw a profit from breaking the fragments, and extracting the Diamonds. We cannot say how long this was continued. M. Chasseau's

paper was written in 1841, and the deposit in question, as far as we can learn, is only again mentioned by M. Semonossoff in the '*Annales des Mines*,' 1842. But we know that in 1855 Mr. T. Redington, a native of Cornwall, was employed by the Vice-President of the province of Minas Geraes to trace the course and tributaries of the principal river of the Diamond district, so as to find the rock from whence the Diamond came. Amongst other localities he visited San Joao, about twenty miles north of Diamantina, and there he found a vein yielding Diamonds which had for about eight years previously been wrought by the natives. This he began to work, and though the number, size, and qualities of the stones found have never been made public, he was still engaged upon it only some few months since, and probably is so at this moment. No doubt these examples will stimulate others to attempt similar discoveries."

COLOURED DIAMONDS.

The Diamond, true king of gems, not content with its own inimitable purity, takes a pleasure, as it were, to assume in turns the proper colours of its subject-classes, and again to surpass each one in its own peculiar excellence. The *Blue* Diamond combines the azure of the Sapphire with its own adamantine lustre, and becomes most lovely by the addition; the *Rose-coloured* far eclipses the Ruby, as does the *Green* the Emerald; so greatly does its native brilliancy enhance these agreeable colours. When any of these three tints is decided, but especially the green, it enormously augments the commercial value of the stone. Not so, however, with the *Milky* tinge that imitates the Opal; and the *Yellow*, the commonest of all, the pale Topaz. This latter, regarded as a great defect,

disfigures the majority of the stones, especially the larger, brought from Brazil. Rarest of all was the *Black*, until the recent discovery of the *Carbonado*, whence now may be cut any number of this contradiction to the very idea of the Diamond; concentrated darkness in place of light.

The most charming piece of jewelry that I ever beheld, was a spray composed with exquisite taste entirely out of coloured Diamonds of all the tints that could be collected in ten years' research by the artist-goldsmith (one of the true Cellini breed), its ill-remunerated deviser.

The most complete collection of coloured Diamonds ever formed was that of Virgil von Helmreicher's, a Tyrolese who had spent much of his life in their pursuit in Brazil. After his death they were secured for the Museum of Vienna.

This distinction of colour was noticed early. Ben Mansur founds his minute system of classification upon it, placing them in the following descending order of value:—1. The White, transparent. 2. The *Pharaonic* (without explanation). 3. The Olive; or white passing into yellow. 4. The Red. 5. The Green. 6. The Blue. 7. The Fire-coloured. "The two first are the most plentiful; the others are rare: but the rarest of all are those quite polished (naturally):" meaning by the last the *Naïfes* of the Hindoos.

ARTIFICIAL IMPROVEMENT OF THE DIAMOND.

Large stones, besides flaws and specks of different colours, sometimes inclose cavities filled up with a black sediment that discolours their whole mass. How to get rid of such impurities without excision and the necessary destruction of the magnitude of the diamond is the problem that certain chemists profess to have solved. De Boot positively asserts that his imperial master, Rudolf II., had

discovered a menstruum distilled from antimony ("aqua mercurialis ex stibio distillata") by means of which, with the application of heat, he was enabled to clear diamonds of the flaws, clouds, and colours which detract so greatly from their value. De Boot declares that he had seen a stone bought for 6000 ducats in the first instance, which after having been thus "emendated" was valued at double that amount. "But," adds he, "a secret like this must be divulged to none." It therefore, like numerous other important arcana of those tentative philosophers, has perished with the discoverer. And now in our day comes forward Barbot, who doubtless has never heard of Rudolf II., and boasts of having attained to the same desideratum, styling himself on his title-page "*Inventeur du procédé de décoloration du Diamant brut.*" But yet he has not advanced so far as the Imperial adept, for his invention merely consists in removing by some chemical means (a secret) the dull crust of the native crystal, thus enabling its exact nature to be ascertained before cutting, so that the purchase of the stone will no longer be a complete lottery as to its result. In the very curious case '*Van Minden v. Pyke*' tried at Croydon, August 9, 1865, to the utter bewilderment of both judge, counsel, and jury, and which turned upon the *identity* of a particular large Diamond, alleged to have been changed by the person entrusted with its sale, it was stated in the evidence that it is a common practice when a large stone is disfigured by a yellow flaw, to roast the same in a crucible filled with borax; the operation changing the yellow into a bluish-black, becoming rather an improvement than otherwise to the lustre of the stone, if successfully performed.* But in this instance, from want of skill in the management of the fire, the

* Mawe gives full directions for the process (p. 33).

yellow flaw had been greatly extended (although blackened) and so had reduced the value of the stone by more than half.*

I had long suspected the yellow Diamond was naturally susceptible of the same improvement from fire as the orange Topaz. My opinion has been verified last year by the experiment of M. Frenny who exhibited at a meeting of the Académie des Sciences a yellow Diamond weighing 4 grammes (15 car.) which by exposure to a high temperature was turned to a fine rose colour. Unfortunately the original sin of yellow returns a few days after the baptism of fire.

CHARLES THE BOLD'S DIAMOND.

Comines relates that in the plundering of the Duke's tent after the rout at Granson where he lost all his jewels,† a common soldier found his "great Diamond which was one of the largest in Christendom," tossed away the jewel as a worthless bauble, but kept the box containing it (a gold one may be well supposed). He had thrown the Diamond under a waggon, but on second thoughts he looked for and picked it up again, and sold it to a priest for one florin; the priest in his turn sold it for three francs to the magistrates of his own canton. This explains how it got into the hands of the Bernese Government, from whom Fugger purchased it, together with the other remarkable trophies of their victory now to be described.

J. J. Fugger, one of the celebrated Nuremburgh family, had left a full and very curious written description illustrated with exact drawings (made by himself in the year

* No professional person can read the depositions of the several witnesses without the full persuasion that the unsuccessful experimentalist was not the *defendant*.

† "Toutes ses grandes bagues."

1555) of the Ducal jewels, and some of the plate purchased by his grandfather, Jacob Fugger, from the Bernese Government. Lambeccius has published his MS. and accurately engraved his drawings in his *Bibliotheca Casarea* (ii. 516).

The Duke's big, deep, pointed Diamond, the talk of all Christendom—"der grosz und dich spitzig Diamandt, von dem in der gantzen Christenheit gesagt wurd"—is shaped as a pyramid five-eighths of an inch square at the base: having the apex cut into a four-rayed star in relief, each ray corresponding with the centre of each face of the pyramid; a most singular and ingenious pattern, doubtless eliciting some of the brilliancy of the stone, but totally unconnected with any idea of the modern principles of facet-cutting. This Diamond proves convincingly that Bequem's invention went no further than this, the cutting of the stone into a definite form—some allusive device, accompanied with the reduction of the sides of the native "point" into perfect regularity and equality with each other. It is set in the midst of three Balais-rubies, cut as depressed, somewhat irregular, pyramids measuring seven-eighths by one-half an inch at the base; and styled, from their correspondence in size and weight, "The Three Brothers." To indicate their natural perfection, Fugger particularly notes down that they were set without a foil, and therefore *à jour*. The four Pearls completing the outline of the Pendant are truly magnificent for their magnitude although somewhat baroques in shape, being each above half an inch in diameter, and certainly approaching, if not equalling, half an ounce in weight. Comines, too, makes mention of the Three Brothers, and of two incomparable Balais besides, known by the quaint appellations the one as "La Hotte" (pouch), the other as "La Balle (bale) de Flandres."

Jacob Fugger bought this pendant together with the Duke's "Cap of Maintenance" of silk with Pearls stitched all over it, having a hat-band of Sapphires and Balais, and a plume-case set with Diamonds (points) of tolerable size placed between alternate Pearls and Balais-Rubies, "for no more" (as he boasts) "than 47,000 florins." The cap, in shape the counterpart of that antithesis to all ideas of dignity, a jockey's cap, terminates in a single huge Balais cut into an acute pyramid, and springing out of an elegant socket resting upon cherub heads set under the four angles of the base. It is remarkable that with this exception all the Balais are fashioned into depressed pyramids.

The pendant Fugger kept by him for many years in the hope and expectation that the emperor Charles V. (the unfortunate Duke's great grandson) would buy it for himself as a family relic: the cap however he broke up, and reset all the stones adorning it for Maximilian II. At last his great-nephew (the writer of the memorandum) sold the pendant to our Henry VIII. just before his death, but adds that he was honestly paid the price agreed upon (which provokingly he has omitted) notwithstanding the demise of the purchaser: a remark by the way that sufficiently betrays the trepidation he had been in as to such a satisfactory contingency. Henry's successor and daughter forthwith made a present of the jewel to her ungrateful bridegroom, and Fugger naturally enough remarks upon the singular coincidence, that this heir-loom should thus have been restored gratuitously by fortune through the hands of Mary to the actual representative in the fourth descent of its original owner, after an estrangement of seventy-six years.

To conclude this notice of these memorials of the magnificence and of the misfortunes of Charles the Bold, I

cannot avoid observing that his spiteful Fate was not to be appeased by his death, but followed him beyond the grave : for she caused to be inscribed upon his monument in Nancy cathedral this most horrific specimen of Dog-Latin ever excogitated by monkish muse :

“ Te piguit pacis, teduitque quietis in vita
Hic jaces, Carole ! jamque quiesco tibi.”

THE SANCY.

The story, perpetually retailed, that the Diamond just described, and the first specimen of the art invented by Berquem, has come down to our times under the name of the almost equally famous “Sancy Diamond,” is a mere fable resting upon a basis of mistakes and confusion. Robert de Berquem, a descendant of the Duke's jeweller, and who would naturally have made the most of such a tradition had it been current in his own times, tells us distinctly the true origin of the “Sancy” in his ‘*Merveilles des Indes*’ (published 1669), in these words :—“*La Royne d'Angleterre d'à present a celuy que diffunct M. de Sancy apporta de son ambassade de Levant, qui est en forme d'amande, taillé à facettes des deux costées : parfaitement blanc et net ; et qui pèse cinquante-quatre carats.*” Now the measurement of the noted Burgundian stone, as given in Fugger's fac-simile of it, namely, five-eighths of an inch square at the base (or *girdle*) would, according to Barbot's scale for estimating the weights of Diamonds by their dimensions, produce a weight of only *twenty-eight* carats, supposing the pattern to be a perfect brilliant. Although a few more carats must be allowed in this case for an extremely elevated apex in place of *table*, yet even this addition will be far from adequate to bring up the sum

to the fifty-four carats of the Sancy. Corsi probably supplies the true origin of many of the stories current respecting this much-talked-of gem, in mentioning a large French Diamond as going by the name of the "Cent-six" (from its weight of 106 carats), which he adds became corrupted in common parlance into "Le grand Sancy." Corsi unfortunately has not taken the trouble to give the name or date of the owner: and no Diamond of that precise weight (or anything that might be mistaken for it) is to be found in the inventory of the Regalia drawn up in 1792: in which the true Sancy figures under its own name at fifty-three and fifteen-sixteenths carats.

Its almond form, faceted all over (a pattern quite unknown in De Sancy's times or indeed in any other, in Europe), would, of itself, not require this express testimony of R. de Berquem to declare that it was an *Indian-cut* stone. In the very year when he was writing, Tavernier was remarking, upon the spot, the fondness of the Golconda lapidaries for covering the entire surface of the Diamond under their hands with small facets in order to diminish as little as possible the original weight of the native crystal. The "Royne d'Angleterre" at the date specified was probably the dowager-queen Henrietta Maria, not the queen-consort Catharine of Braganza. The former supposition would explain how the Sancy subsequently appears in the possession of James II., from whom when in exile it passed to Louis XIV. for the consideration of 625,000 fr. (25,000*l.*).

The Sancy was stolen together with the other regalia from the Garde-Meuble, in the great robbery of September, 1792, and being more convertible than its companion the Regent, was never recovered. But Barbot asserts positively that a Diamond exactly agreeing with its description in all particulars was afterwards sold by

an agent of the Bourbons (the elder branch) in the year 1838 to the Princess Paul Demidoff, for the sum of half a million of roubles (75,000*l.*). This fact strongly confirms the suspicions excited from the first as to the true cause of its abstraction in 1792. The price obtained for it on this occasion must be grossly exaggerated by report, unless indeed it is estimated in *paper-roubles* which would reduce the amount nearly one-half. For calculating its value by the established rule, $54 \times 54 \times 12 = 34,992$.; a theoretical estimate never attained by the selling prices of very large Diamonds, especially when only Indian-cut, as the Sancy was. In the Inventory of the Crown Jewels it is entered at one million fr. (40,000*l.*).

By a singular caprice of Fortune, this mythical gem has recommenced its wanderings, and returns in our day to its birthplace, the East. It has been purchased of the Demidoff family (February, 1865), for the sum of 20,000*l.*, by Messrs. Garrards on the commission of the Parsee millionaire, Sir Jamsetjee Jeejeebhoy of Bombay.

To conclude with a few particulars of its history, and of the gallant nobleman whose name this stone has done more to immortalise than his own eminent services both in camps and courts. That the Diamond of the French regalia was *not* that of Charles the Bold, may be demonstrated from its actual weight in another way, the converse of that already adduced. The weight of the Sancy was 54 carats (or three *gros* of 72 grs. each = 216 grs.). Now Clusius, than whom no person had better opportunities of getting exact information, states that the largest Diamond ever seen in Europe was the one purchased for 80,000 crowns from Carlo Affetati of Antwerp, by Philip II., in the year 1559, designed as a bridal gift to his unfortunate second wife, Elizabeth, the youngest daughter of Henri II. of France. This stone weighed 47½ carats. But Philip had

been in possession of the jewel of his ill-starred ancestor for six years before this date. It is therefore a logical deduction from Clusius's statement that the weight of the Burgundian Diamond was far below that of Affetati's; and consequently that it did not so much as approach to the 54 carats of the actual Sancy.

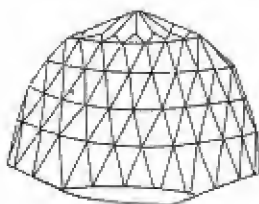
Now to attempt to discover the origin of this traditionary confusion between Charles the Bold's Diamond and the Sancy. Nicolas Harlai, Seigneur de Sancy, was the early friend and in after life treasurer to Henri IV. He changed his religion at the same time with his master and acted as his envoy at several courts, Queen Elizabeth's amongst the rest. In the year 1589 he obtained a certain large Diamond (not farther described) from Dom Antonio, the pretendant to the Crown of Portugal, as security for a loan of 100,000 livres, which was never discharged. Now the tellers of the story take upon themselves to assume a step *here*, and make out this stone to be the ancient Burgundian, which, as we have seen, was then in the possession of Dom Antonio's mortal enemy Philip II.: this change of ownership therefore was not one very likely to have taken place. Harlai being at Soleure, his king and friend wishing in his turn to raise some money upon this valuable pawn in order to hire a body of Swiss, the Diamond was sent to him in the hands of a trusty servant of Harlai's. But he, as the story goes, being beset by robbers upon the road, had only just time to swallow the Diamond before he was murdered and stripped by them. His master, learning his fate, had the happy idea to count upon this last expedient of the despair of his faithful envoy, and therefore disinterred his corpse, opened it, and was not disappointed in his expectation of recovering his treasure out of this unsuspected hiding-place. But his enjoyment of it was brief, for carrying out his first intention, he

pledged it to the Jews of Metz for a certain considerable amount, which being unable to repay he forfeited the stone for ever; as the well-informed author of his life in the 'Biographie Universelle' has recorded. This Diamond, therefore, even granting it to be Charles's and Philip's, at this point entirely disappears from the scene: and there only remains the one subsequently brought by Harlai "from the Levant," that is from Constantinople, during his embassy to the Grand Seigneur. That he was an amateur in Diamonds is indicated by the fact of his purchasing Dom Antonio's in those troublous times, as well as from his love of display and magnificence. Sancy died in 1627; and the next notice we find of his well-known Diamond is forty-two years later, as then belonging to the "Queen of England."

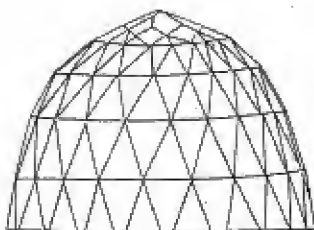
KOH-I-NOOR.

To borrow the forcible language of Professor Maskeleyne, "The history of this Diamond is one long romance from then till now; but it is well authenticated at every step, as history seems never to have lost sight of this stone of fate from the days when Ala-ud-deen took it from the Rajahs of Malwa, five centuries and a half ago, to the day when it became a crown jewel of England: while tradition carries back its existence in the memory of India to the half-mythic hero Bikramajeet,* Rajah of Usjein and Malwa, 57 B.C.; and a still wilder legend would fain recognise in it a Diamond recorded as worn by Carna, Rajah of Anga, who fell in the "great war," and first discovered near Masulipatam, in the bed of the Godavery, 5000 years ago."

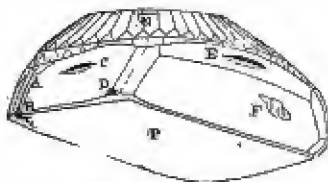
* Better known as Vikramaditya, the expeller of the Sace (Scythians), from India.



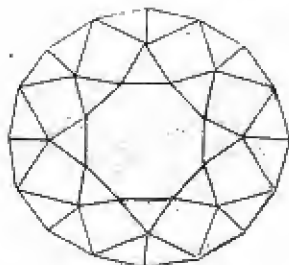
The Orloff, 143 c.



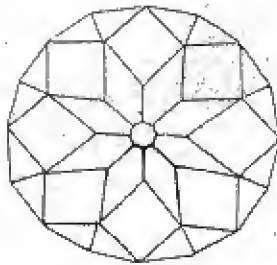
The Grand Mogul, 208 c.



Koh-i-noor, Indian cut, 188 c.

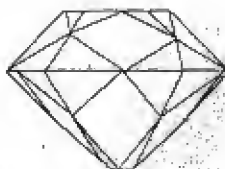
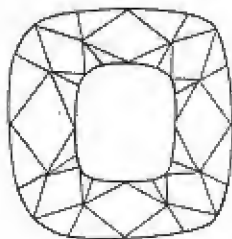


Upper surface.



Under surface.

Koh-i-noor, recut, 182½ c.



The Regent, 136½ c.



Our great mineralogist identifies this with the large Diamond described by Baber, the founder of the Mogul empire, in his Memoirs, the authenticity of which is unquestionable:—"He mentions it as part of the spoil taken by his son Humayun at Agra, after the battle of Paniput, in which fell Ibrahim Lodi, and with him his ally or tributary, the Rajah of Gwalior, Bikramajeet, custodian of the fortress of Agra. It is reported by Baber to have come into the Delhi treasury from the conquest of Malwa by Ala-ud-deen in 1304."

"Baber gives its weight as about eight *mishkals*. In another passage he estimates the *mishkal* at forty *ratis*, which would make its weight 320 *ratis*." After mentioning the varying weight of the *rati* at different times and places, he proceeds: "But the eight *mishkals* of Baber afford a far more hopeful estimate of the weight of this Diamond. This is a Persian weight, and seems to be and to have been far less liable to variety of value at different times or places. The Persian *mishkal*, or half-dirhem, weighs 74.5 grains Troy, and eight of these equal 596 grains, or 187.58 carats. The Koh-i-noor in the Exhibition of 1851 weighed 186 carats. This would require a weight of 1.848 grain for the *rati*,—a number nearly approximating to that given by the coins of Akbar."

Applying, then, the conclusion that the great Diamond which was the spoil of Ala-ud-deen in 1304, and had probably been for ages the crown jewel of the independent Rajahs of Malwa, passed to the Mogul conqueror of the Patan sovereigns, and was so inherited by the Mogul emperors, its subsequent history may be thus traced. "It remained at Delhi until another, the fiercest and the last, of the great inroads of the western Tartar peoples broke over the hills of Affghanistan, and flooded the plains of North-Western India.

“The history of Thamas Kouli Khan, Nadir Shah, is sufficiently near to the present times to fall almost within the field of European contest in India. This conqueror from the West gave back the prostrate empire of India to his Tartar ‘kinsman’ on the throne of Delhi, and *exchanged turbans* with him—so says tradition—in sign of eternal amity. The proud Diamond of the Mogul was in the cap of his vassal, and was saluted with the title of ‘Koh-i-noor,’ *Mound of Light*; by his suzerain. It went back with all the fabulous wealth the Persian host bore with them to Khorassan. From Nadir Shah it passed into the hands of his powerless representative Shah Rokh; but it was not one of the jewels afterwards extorted from him by such frightful torture. The history of Ahmed Shah, founder of the short-lived Dooranee empire, is that of many another historic name. The realms conquered by Nadir fell asunder at his death, and the Affghan captain of his horse and lord of his treasure secured for himself the kingdoms surrounding his native passes, and erected them into an empire which extended from Moulton to Herat, from Peshawar to Candahar. From his Affghan eyrie he descended to aid his old master’s son in the hour of his adversity, sealed an alliance with him, and bore back the great Diamond, whose beauties ‘its blind owner could no longer see,’ and which became once more an equivocal symbol of friendship between sovereigns, of whom the recipient of the Diamond was the stronger. From Ahmed Shah it descended with the throne to his sons. The wild romance of Shah Soujah’s life was in no small degree linked with the gem. Long hidden in the wall of a fortress that had been Shah Zeman’s prison, it shone on the breast of Shah Soujah when the English embassy visited Peshawar. Mahmoud reasserted with success the claim of might to the empire of his brother,

and Shah Soujah became an exile. But his companion in that exile was the Koh-i-noor; and hunted from Peshawar to Cashmere, and decoyed from Cashmere to Lahore, Shah Soujah became in semblance the guest, in reality the prisoner, of Runjeet the Lion. He disgorged the prize for the sake of which the Lord of the Five Rivers had inveigled him into his lair; and the ex-king of Cabul and Dooranee prince escaped the gripe of his savage tyrant only to enter upon adventures the story of which might, for incident and hardship, challenge the pages of romance. The Koh-i-noor had again been true to its tradition. It had passed from the weak to the strong under the semblance of righteousness. 'At what do you estimate its value?' said Runjeet to his victim. 'At good luck,' replied Shah Soujah; 'for it hath ever been the property of him that hath conquered his enemies.' The successors of Runjeet Singh inherited the Koh-i-noor; and when the Sikh power fell before the arms of England which it had challenged, the talisman of Indian sway passed from the treasury of Lahore to the jewel-chamber of Windsor."

The Hindoos, however, have constantly enjoyed the sweet consolation of revenge that Nemesis so often grants to the worsted side, and trace out the curses and the ultimate ruin inevitably brought by the *genius* of this fateful jewel upon its successive possessors ever since it was first wrested from the line of Vikramaditya. And in fact its malevolent influence, if we glance back over its history since 1304, far exceeds that of the Necklace of Eriphyle, or the Equus Scianus of Greek and Roman tradition. First falls the vigorous Patan, then the mighty Mogul empire, and, with vastly accelerated ruin, the power of Nadir, of the Dooranee dynasty, and of the Sikh. In fact, Runjeet was so convinced of the truth of

this belief, that, having satiated his covetousness in the enjoyment of its possession during his lifetime, he vainly sought to break through the ordinance of fate, and to avert the concomitant destruction from his family by bequeathing the stone to the shrine of Juggernaut for the good of his soul and the preservation of his dynasty. But his successors could not bring themselves to give up the baleful treasure—each one, doubtless, acting on the maxim “*après moi le déluge* ;” but Destiny was too rapid in her movements for them: the last Maharajah is now a private “gentleman about town,” and the Koh-i-noor was presented by Lord Dalhousie, in the name of the East India Company (since, in its turn, defunct in disgrace), to Queen Victoria in 1850. The Brahmin sage who studies the Book of Fate is probably not dispossessed of his hereditary superstition touching the malign powers of this stone when he thinks upon the so speedily following Russian war, that completely annihilated the prestige of the British army, the legacy of Wellington’s successes, and upon the events of the Sepoy mutiny, three years later, that caused the very existence of England as a nation to hang for months upon the magnanimous forbearance of one man: an ugly truth, however much we may affect to ignore it.

The re-cutting of the Koh-i-noor (1862), though executed with the utmost skill and perfection, as far as concerns the art, was by its very nature a most ill-advised proceeding, for it has deprived the stone of all its historical and mineralogical interest. As a specimen of a gigantic Diamond whose native weight and form had been as little as possible interfered with by art (for the grand object with the Hindoo lapidary is the preservation of weight), it stood without a rival, save the Orloff, in Europe. As it is, in the place of the most ancient gem in the history of

the world, older even than the Tables of the Law, and the Breast-plate of Aaron, supposing them still to exist, we get a bad-shaped, because unavoidably too shallow, a modern brilliant, a mere lady's bauble, of but second water, for it has a greyish tinge, and besides this, inferior in weight to several, being now reduced to $102\frac{1}{2}$ carats.

The operation of re-cutting (which is said to have cost 8000*l.*) was performed in London, under the care of Messrs. Garrards, the Queen's jewellers, a small engine of four-horse power being erected for the purpose upon their premises. It was conducted by the best hand sent over from M. Coster's great atelier at Amsterdam, Voorsanger (who gained afterwards the prize-médal awarded to his art at the Paris Exhibition), assisted by another skilful workman from the same place. The actual cutting occupied no more than thirty-eight working days: and the Star of the South, a much larger diamond, also cut by Coster at home, only three months. Such is the advantage gained by the use of steam-power: compare this expeditiousness with the *two years* necessary for the cutting of the Pitt by the old hand-process. In some parts of the work, as when it was necessary to grind out a deep flaw, the wheel made 3000 revolutions per minute.

Coster had furnished several models of various patterns proposed by him for the re-cutting of this awkwardly-shaped stone, and unfortunately that of the regular brilliant was decided upon by the persons to whom they were submitted in this country. Such a pattern, in consequence of the flattened and oval figure of the stone to be operated upon, entailed the greatest possible amount of waste. There can be no doubt that had the matter been left to Coster's own judgment he would have preferred the drop form, like that given to Mr. Dresden's brilliant, which, when

compared with its native crystal in my plate, strikingly exhibits the economy of the precious material thus obtained. But in a historical relic like this, the sole course that would have recommended itself to a person of taste was the judicious one pursued some years before by Messrs. Rundell and Bridge, in their re-cutting of the Naasack, a gem by the way much resembling the Koh-i-noor, both in its native and artificial figure. In this, by following in the traces of the Hindoo lapidary, amending his defects and accommodating the pattern to the exigencies of the subject-matter, they transformed the rudely-faceted, lustreless mass into a Diamond of perfect brilliancy, at the sacrifice of no more than ten per cent. of its original weight.

MOGUL.

Incomparably the largest *authentic* specimen of the Diamond ever yet discovered (for the genuineness of the monster "King of Portugal's" is more than questionable) was that known by the name of "The Mogul." It was found in the mine called by the Indians Gani, by the Persians Coulour, about seven days' journey distant from Golconda, towards the year 1650, when those mines were farmed by the afterwards so notorious Vizier Mirgimola, or to give his name according to the English style, Meer Jomlah. Concerning this personage it is necessary to begin with a few particulars of his history, as they have an immediate bearing upon the question of the identity of the Diamond now under our consideration. Mirgimola was a Persian by birth, but by his merit had risen to the dignity of vizier and general to the King of Golconda. He accumulated enormous wealth, principally from farming

(under the names of others) the diamond mines of that region, where he prosecuted the works with the utmost vigour, and amassed Diamonds "by the sackful." He likewise on his own account overran the Carnatic, and despoiled its most ancient temples of incalculable treasures. But his wealth roused at last the jealousy of his master, which was inflamed to fury by the discovery of Mirgimola's amour with the queen-dowager, and he openly threatened to destroy him. But the vizier, apprised in time of his master's intentions by one of his creatures at the court, was able to escape with all his treasures to the camp of Prince Aurungzeb, then governor of the neighbouring provinces, who, acting upon his advice, by a secret expedition surprised and all but captured the king of Golconda, and blockaded him for two months in his fortress, until he was, through the intrigues of his brother and sister, recalled by letters from Shah Jehan, just as he was on the point of starving the garrison into a surrender. Mirgimola, on his introduction to the Great Mogul, gained his favour by magnificent presents, foremost amongst which figured the unexampled Diamond in question.*

When the wily Persian, having thus so neatly "wrought his great revenge" upon his former sovereign, in the most literal sense made himself friends out of the mammon of unrighteousness by sacrificing his unparagoned Diamond to his new patron, Shah Jehan—its weight, says Tavernier, was no less than 787½ carats. The stone however, as was unavoidable in one of such magnitude, was full of flaws, to get rid of which (as it would seem) the imperial jeweller,

* Mirgimola's history is minutely related by Bernier in his '*Narration des Evénements*,' &c., from personal knowledge, he having gone to Agra in 1655, and remained in India twelve years, during eight of which he was Aurungzeb's own physician. He gives no particulars as to the quality or size of the Diamond "so much talked about," as he expresses it.

Hortensio Borghis, a Venetian,* cut it down entirely by grinding (*égriser*), and without saving any particles by cleavage, to the comparatively insignificant weight of 240 carats. The figure he thus brought it to was "a round rose of the shape of an egg cut in two," and very high-crowned, to use the technical terms: "Une rose ronde, fort haute d'un côté, . . . de la même forme que si l'en avoit coupé un œuf par le milieu." He doubtless fancied that he had been completely successful in effecting his grand object, for the stone was now "of fine water, with only one crack on the lower edge and one little flaw in its interior." But the Mogul (whether Shah Jehan or Aurungzeb is not stated) was so vexed at this lamentable waste of the precious substance and the yet more lamentable diminution of the weight of the finished work, that instead of paying the unlucky Venetian for his incredible labour, he fined him 10,000 rupees, and "more too if he had had it to lose," observes Tavernier. Doubtless Borghis was at the time well content to be allowed to keep his head upon his shoulders.† This Diamond was exhibited to Tavernier (Nov. 1, 1665) together with the other crown jewels, in the presence of Aurungzeb himself, then the

* Evidently the jeweller mentioned, without naming him, by Bernier, as having taken refuge at the Mogul's court after having cheated all the princes of Europe with his *doublets*.

† Tavernier observes hereupon:—"Si cette pierre avoit été en Europe, on l'auroit gouvernée d'un autre façon, car on en auroit tiré de bons morceaux, et elle seroit demeurée plus pesante, au lieu qu'elle a été toute égrisée." Meaning that pieces of respectable size would have been cut off at the first shaping (*brutage*) and turned to account, whilst the Diamond itself, if properly planned, would have retained more of its original weight: whereas all this was wasted by its being entirely ground down on the wheel, and not *cleaved* to shape beforehand. He goes on to say that, had Borghis understood his business, he would have got out of it some good bits for himself, without doing any wrong to his employer, besides saving himself all the trouble of grinding it down,—"*tant de peine d'égriser.*"

reigning emperor. The whole business was conducted with the utmost solemnity and precision: the stones were brought in upon two lacquered trays covered with brocade, Akalkan, the keeper of the jewels attending, they were counted over thrice, and a list of them made out by three scribes. "For," adds the old Frenchman, "the Indians do all business with the utmost circumspection and patience, and if they see any one in a hurry, or making a fuss about anything, they either stare at him without saying a word, or else laugh at him for a fool." (For the full details of this interesting transaction the reader is referred to his '*Voyage*,' ii. pp. 278, 372.)

Tavernier, after carefully examining the great Diamond and weighing it with his own hands (as he expressly states), which proves that at the time it was unset, has given us what is evidently a very faithful drawing of it, and which exactly corresponds with his own description of its weight, form, and pattern.

All the circumstances warrant the belief that *this* was the grand Diamond that Nadir Shah acquired by the ingenious device above related, just before the sack of Delhi in 1739. It is supposed still to exist amongst the regalia of the Persian crown, and to be there designated as the *Deryai Noor*, "The Ocean of Light." But as no stone of that unmistakable size and pattern is to be recognised amongst the drawings of the Shah's Diamonds brought lately to this country, there is better reason to believe that it disappeared, perhaps to turn up again at some future day, in the plundering of Nadir's treasures, which followed the assassination of that conqueror.

This "Mogul" is often confounded with the Koh-i-Noor, and the same tales are repeated as to the discovery, fortunes, and influence of either, without discrimination. But Tavernier had no knowledge of the latter, for it is

impossible to recognise a stone of so marked a character in his subjoined description of the rest of Aurungzeb's Diamonds.

The next largest to the "Mogul" was pear-shaped, "en fort bonne forme, et de belle eau," weighing $62\frac{1}{2}$ ratis = $54\frac{1}{2}$ car.: the rati being taken at $8\frac{1}{2}$ grs., or $\frac{1}{4}$ carat. All the other Diamonds were much inferior in weight even to this.

But Bernier mentions that Shah Jehan, the "best judge of precious stones in India then living," still retained possession (though deposed and in confinement) of a large quantity of his own collecting, and on Aurungzeb's manifesting a desire to obtain them (under the pretence of borrowing a few to grace his coronation—rather a cool request under the circumstances), sent him word that the hammers were kept in readiness to smash them to dust upon the first attempt to deprive the rightful owner of them. It is more than probable that the Koh-i-Noor was of the number: for Shah Jehan was still in possession of his life and treasures at the time of Tavernier's visit.

Indeed, the list of Aurungzeb's jewels must strike every intelligent reader as poor in the extreme for so mighty a monarch, having for tributaries the kings of Golconda and of Vizapour. But this poverty is fully explained by the permission granted to his father to retain his old favourites as the solace of his captivity. Amongst these would necessarily be the Koh-i-noor, both by reason of its value and its fame. On Shah Jehan's death, in the February following Tavernier's interview with his son, these jewels, which filled a large basin, were surrendered by the de-throned emperor's too-well-beloved daughter and companion in captivity, Jehanira, to Aurungzeb, then firmly established on the throne.

The question will naturally arise, How came Mirgimola's especial present to Shah Jehan, and therefore the old man's

own private property, to be found, before his demise, in the possession of his undutiful son? A satisfactory answer is supplied by a reference to the length of time required for cutting large Diamonds by the old process. The "Regent," half the size of the "Mogul," required *two* years for the operation, although facilitated by recourse to cleavage: the "Mogul," therefore, which, besides being of a more elaborate pattern, was entirely ground away upon the wheel, cannot possibly be supposed to have occupied less than double that space of time for its cutting. Now Mirgimola took refuge at the Mogul's court in 1655, and before the end of the next year Shah Jehan (then upwards of seventy), having fallen dangerously ill, had been virtually deposed, and, as it were, imprisoned by his eldest son Dara, who thus sought to make sure of the succession. Aurungzeb took up arms against Dara, defeated him, and proclaimed himself emperor in August, 1658. Thus, almost immediately upon the great stone's being put into Borghis' hands, its rightful owner had lost all control over it: in fact, had he been able or permitted to superintend the operation, there can be no doubt his experience and taste in such matters would have brought about a widely different result.

There now remains to be considered a theory advanced by Prof. Maskelyne, and supported by very elaborate and ingenious calculations, but in which I, though most reluctant to differ from so high an authority, cannot possibly acquiesce. Briefly stated it amounts to this, that the large Diamond exhibited to Tavernier was not Mirgimola's (which he never saw at all, it being still in the keeping of its second owner), but the Koh-i-noor itself, and that he applied to the latter the story he had heard about Borghis, and his mode of treating the other. To get over the vast discrepancy between the weights of the two, it is sug-

gested that Tavernier was in error as to the *rati* in which that of the "Mogul" is estimated, and confounded the *pearl-rati* with the *jeweller's-rati*, thus nearly doubling the sum of the 320 *ratis*, the Indian weight of the stone shown him, and bringing it up to the 240 carats given by him, instead of the actual 184 of the Koh-i-noor.* All this assertion rests on the single fact that Baber states the weight of the great Diamond captured by Humayun, which all agree to be the Koh-i-noor, at 8 *miscals* = 320 *ratis*: whilst the stone seen by Tavernier was precisely of that weight, although by his estimating the *rati* at seven-eighths of a carat, he brings up the sum to the excess already specified. Against this solitary argument a whole host of others are to be opposed. The stone Tavernier so carefully examined with all the attention its unique character and history would naturally excite in him, was circular, rose-cut, very deep, of fine water, with but one little crack externally, and one flaw internally, and the work upon it that of an European lapidary; whereas the Koh-i-noor was in outline an irregular ellipse, faceted to no definite pattern, very flat, exhibited no more water than a bit of rock-crystal, had several flaws, besides a large deficiency or fracture at one end, and rude grooves cut in the sides, whilst all the work upon it was of that peculiar character which the least experienced eye would detect at once as that of a Hindoo diamond-cutter.†

* 320 *ratis*, calculated according to the value fixed by Professor Maskelyne, will give about 184 carats.

† A second theory has been started almost too ludicrous to require mentioning, but that it has appeared in print, and been republished as well founded. It makes Borghia cut up the big stone entrusted to his skill into *three*,—the Mogul, the Koh-i-noor, and a third captured amongst the jewels of the harem of some petty Rajah, whose turn came to be devoured in 1832, and which Dr. Beke speaks of as "supposed to be cut from the Koh-i-noor," the supposition bearing upon its face the evident stamp of a bit of mess-room gossip.

Besides, it is almost beyond belief that a man whose business was the dealing in Diamonds, and who had visited India expressly for that purpose, should not have understood the true relation of the rati to the carat, a weight that he was every day using, and thus have cheated himself to so exaggerated an extent in all his dealings with the native merchants. And what, with me, settles the matter, his estimate of the rati is almost the same as that given a hundred years before him by the well-informed Garcías ab Horto, who puts it at three grains of wheat, and the Portuguese carat at four.*

THE "PITT" OR "REGENT"

This stone, found at Puteal, 45 leagues from the city of Golconda, was next to Mirgimola's the largest on record, weighing in the rough 410 carats. It was bought by Governor Pitt of Fort St. George, Madras, from the Parsee merchant Jamehund, according to his own statement, for the sum of 12,500*l.*, and not from "the honest factor," to whose agency Pope assigned its acquisition, to Pitt's infinite annoyance. To cut it into a perfect brilliant, in London, occupied two entire years at a cost of 5000*l.*; but which was nearly covered by the value of the fragments separated in shaping it, which amounted to 3500*l.* This operation reduced its weight to 136½ carats,

* The violent fluctuations in the weight of the rati, at different times, are shown by the note in the 'Ayesen-Akbary,' p. 382, under "Jewellers' Weights :"—"His Majesty has fixed it at 2 bisweha, or 10 barleycorns to the Ruttee." And under "Bankers' Weights :"—"Formerly the Ruttee contained 6 barleycorns." Now 32 barleycorns (literally, "according to Cocker") equal 24 grains troy; so that the barleycorn = ¾ grain troy. According to this, the ancient rati = 4½ grains; and Akbar's new one = 7½ grains; such being far in excess above Tavernier's estimate,

but made it, for perfection of shape as well as for purity of water, the first Diamond in the world; as it still continues. After a long negotiation, the Regent Orleans concluded the purchase of it for 135,000*l.*: a price considered very much below its value; for in the inventory of the Regalia, it is entered at twelve millions of francs, or 480,000*l.*

Uffenbach, a German traveller who visited this country in the year 1712, states in his most amusing account of his sojourn in London (where with true Teutonic conscientiousness he made a point of seeing all the sights from "Cupid's Garden" on the Thames to Woodward's fossils) that he made many fruitless attempts to obtain a view of this Diamond, then recently brought home by Governor Pitt, and the fame of which had already been spread all over Europe. But there was no obtaining an interview with the far from enviable possessor, so fearful was he of robbery (and not without cause in those unpoliced days) that he never let be known beforehand the day of his coming to town, nor slept twice consecutively in the same house. During the next five years—that is, until the Regent relieved him of its custody in 1717, Pitt must have felt his too-precious stone almost as harrassing a possession as did its first finder: the slave who, as the story goes, concealed it in a gash made for its reception in the calf of his leg, until he had the opportunity of escaping to Madras. There the poor wretch fell in with an English skipper, who, by promising to find a purchaser for the stone on condition of halving the proceeds, lured him on board his ship, and there disposed of his claims by pitching him overboard. The rogue obtained from Jamchand no more for this wonderful piece than the paltry sum of 1000*l.*, which he speedily ran through in debauchery, and when all was

finished, hanged himself—a most appropriate finale to the tale.

The robbery of the *Garde Meuble*, already alluded to (Sancy), was effected under the most suspicious circumstances as regards the keepers: who were supposed to have acted in the interest of the royal family. The Regalia, including gold plate of almost incalculable value, had been sealed up by the officers of the Commune of Paris, after the massacres of the 10th of August. On the 17th of the following month, the seals were found broken, the locks picked by means of false keys, and the cabinets empty. The thieves were never discovered; but an anonymous letter directed to the Commune gave the information where to find the Regent, together with the noble Agate Chalice of the Abbot Suger (which had been buried in the Allée des Veuves in the Champs Elysées), the latter stripped of its precious gold-mounting. Both these objects were too well known to be convertible into money without certain detection; hence this politeness, on the part of the thieves; but everything else had disappeared for ever. The fortunes of Buonaparte may be said to have been founded upon this Diamond: it was verily the Rock upon which his empire was built, for after the famous 18th Brumaire, by pledging the Regent to the Dutch Government, he procured the funds indispensable for the consolidation of his power. After he became emperor, he wore the Diamond set in the pommel of his state-sword: doubtless holding that to be a more significant and needful article of his imperial paraphernalia than either crown or sceptre. One is tempted to indulge, after old Pliny's fashion, in profound reflections upon the direct influence of this remarkable gem in raising to the helm of government of the two hostile nations; in one the Corsican adventurer, in the other his once equally renowned adversary William Pitt, whose accession to the

premiership had never been but for the fortune based upon the "lucky hit" of his great-grandfather.

THE "ORLOFF."

The Orloff Diamond now set in the top of the imperial sceptre of Russia, is said by report to have originally formed one of the eyes of the great Idol at Sheringham. A French deserter having literally become enamoured "*des ses beaux yeux*," by a pretended conversion and a great show of devotion got himself made one of the priests to the temple, and, watching his opportunity, extracted his patron's eye from the socket, and made off with it to Madras.* It is to be supposed that the god whilst waiting for fortune to send him a fellow-diamond to complete his optics had made shift with one of glass in the meanwhile, as only *one* diamond figures in the story. Its weight is 198 carats, and its pattern a rose extremely high-crowned, in fact much resembling the shape of the "Mogul" in Tavernier's drawing. That it is an Indian-cut stone, Prof. Maskelyne, who lately examined it with care, assures me there can be no doubt; all the facets exhibit the blunt edges and rounded surfaces that mark the style. Its water

* This bit of romance is given by Datens, writing at the time. More credit, however, seems due to the account which Pallas (*Voyage II.*) says he had received from the son of the last vendor, an Armenian named Shafress. This man had purchased it from an Afghan General, formerly in the service of Nadir Shah. Its original place had been amongst the stones decorating that conqueror's throne; and upon the plundering of his treasury, after his assassination, this enormous Diamond had fallen to the share of the Afghan. In outline it so much resembles Tavernier's "Mogul," that if we admit the possibility of some error in his calculation of the weight of the latter, the Orloff may claim to be that long-lost phoenix. Certain it is that Nadir Shah brought it back amongst the spoils of Delhi, along with the Koh-i-noor.

has a faint cast of yellow. The story goes on that the successful Frenchman sold his prize to an English captain for 2000*l.*, the captain resold it in London to a Jew for 12,000*l.*, and subsequently the stone got into the hands of a Greek, who offered it for sale to Catharine II., but she declined the purchase as beyond her means. Prince Orloff, however, bought it and presented it to his imperial mistress (1772), paying for it 90,000*l.* in ready money, an annuity of 4000*l.* for the seller's lifetime, and a patent of nobility into the bargain.

THE "NIZAM."

This Diamond is somewhat almond-shaped, almost in its native condition: although it seems to exhibit some traces of an attempt to shape it into the mystic *Yoni*, probably with the intention of its being placed, as her usual attribute, in the hand of *Parvati*, the goddess of generation. In the cast from it which I have examined, the ineffectual attempts of the Hindoo lapidary to work the obdurate material to his fancy are extremely curious. This stone was by some very ominous accident broken asunder in the year of the great Indian revolt. Weight 340 carats.

RAJAH OF MATTAN'S.

This Diamond comes next to the original crystal of the Regent in magnitude, its weight being 387 carats, and is reported to be of the finest water; as far as can be judged in its native state. It was found at Landak, Borneo, in the year 1787. Lowe ('Sarawak,' p. 28) was informed by a party professing to be a competent judge of stones, that he had examined this renowned Diamond, which is actually in the possession of the present Rajah: it is

egg-shaped, with an impression (indentation) on one side. But, adds the same informant, to strangers a mere bit of crystal is shown in its stead, out of fear of exciting the cupidity of his neighbours the Dutch at Pontiniak, who, having already despoiled this unfortunate prince of his lands, would certainly seize upon this last relic of his prosperity were they assured of its genuineness. Such being the state of the case, the true character of this long-celebrated gem cannot be regarded as satisfactorily established.

*"THE GRAND DUKE OF TUSCANY," OTHERWISE
CALLED "THE AUSTRIAN YELLOW."*

This stone remains the largest cut Diamond in Europe, after the Orloff, weighing $189\frac{1}{2}$ carats. Tavernier, who had seen it at Florence in the middle of the seventeenth century, and who gives a very accurate drawing of it, remarks what a pity it is that "its water has a tinge of yellow." This *tinge*, I am informed on the highest authority is a very strong one indeed, almost destroying its brilliancy. Its pattern is a double rose: that is, a spheroidal stone faceted on both sides. There is a tradition that it was bought for a trifle off a curiosity stall in Florence, being considered as no more than a yellow crystal. This must have been shortly before Tavernier's visit (who says nothing of its history), for the well-informed De Laet, writing but a few years before, had heard nothing of the existence of Diamonds of this extraordinary* weight. A fable retailed as frequently as the other respecting the Sanoy, but infinitely more preposterous, makes out *this* also to be the identical stone, Berquem's masterpiece, lost by Charles either at Granson or Nanoy. How it has passed, changing its title thereby,

* Mentioning 70 carats as the highest limit known (p. 8).

from Tuscany into the keeping of the very *acquisitive* Emperor of Austria is unknown to me: probably it accompanied Peter Leopold in his translation from the Grand Ducal to the imperial dignity.

DIAMOND-CUTTING.

The art of diamond-cutting seems to have had its birth in Hindostan, and that at a very early period. This may be inferred, though somewhat indirectly, from many circumstances. Garcias ab Horta, writing in 1565, remarks that the Hindoos set a very high value upon the "Diamonds of the "Old Rock," particularly those finished by the hand of Nature herself, called by them "Naifes;" "for, say they, 'as much as a virgin is to be preferred to a woman already deflowered, so much is a Diamond perfected by Nature superior to one polished by human art.' But the Portuguese hold the contrary opinion, and set a much higher value upon the artificially-cut stones." Again, the antiquity of the Indian method of diamond-cutting may be gathered from the fact that when Tavernier visited the Raolconda mine (1665) he found a multitude of diamond-cutters established there, and fully employed. Each was furnished with a wheel of *steel*, about the size of a dinner-plate. They operated on only one stone at a time, but did their work rapidly, having diamond-powder *à discretion*. If the rough stone were clear, they did nothing more than polish the natural faces of the crystal, in order not to detract from the weight, but if it contained flaws, or black or red specks, they covered it *all over with facets*, so as to disguise them. So invariably was this their practice that Tavernier, as soon as he saw an Indian Diamond faceted, was certain of its being defective, and was put on his guard accordingly.

It is contrary to the Hindoo nature to suppose that they had learnt this art from Europeans, who themselves were only commencing to facet the Diamond (as will be shown presently), and perhaps to make *Roses* some twenty years before. Besides, had the method been of recent introduction at the mines, that very particular observer, Tavernier, would certainly have noted it down. Again, the Koh-i-noor, a gem known from "the times of the gods," was in its original state cut after a very remarkable pattern, being covered with a row of long narrow facets, enclosing the base of an extremely depressed four-sided pyramid. Now, even supposing this was done after the stone had come into Baber's possession, which indeed seems indicated by his words that "*after* it was cut it weighed eight miscalas," yet even this latest date refers to the year 1530-2, long before any such fancy-cutting had been thought of in Europe.

To come now to the invention of the same art (or its introduction from the East) in Europe, a subject perplexed with the most conflicting statements, arising mainly from the writers upon this point having successively copied the conjectures of others, instead of taking the trouble to consult original and contemporary authorities. These conjectures will be noticed in what follows, and something more satisfactory, it is hoped, because collected in the opposite manner, will be offered in their stead.

In the first place, we may take as well founded the "*vetus et constans opinio*" that the true method of cutting the Diamond, meaning by this term the power of reducing it into any desired pattern, was unknown in *Europe* before its invention by Louis de Berghem (or Berquem) of Bruges, in the year 1475: Laborde, indeed, pretends to discover mention of *tailleurs de diamant*; one of them, Hermann, being designated "a skilful workman," as esta-

blished at Paris so early as 1407; and also of three *diamant slypers* at Bruges, in 1465. But the very title of the last professionals proves of itself that their practice extended no further than the polishing the natural faces of the crystal, or the removing the greenish film that frequently veils its purity; operations to be effected with the aid of emery alone, although by a very tedious process.*

Louis de Berghem first essayed his new-invented art upon three large Diamonds entrusted to him by Charles the Bold; the first a deep-shaped stone (confounded by all retailers of the story in *later* times with the famous *Sancy*); the second flat and thin, a *table* in fact, which the Duke presented to Sixtus IV.; the third, being very irregular in outline, the artist cut into the figure of a heart and triangle combined, which was set in a ring shaped as two hands clasped (the symbol of good faith) and sent to Louis XI.; an allusion, though in an acceptable form, to his deficiency in that virtue. The improvement in the beauty of the Diamond, thus treated, was so remarkable that Charles rewarded the inventor (according to the testimony of his descendant Robert de Berquem) with the munificent donation of 3000 ducats.

The exact style of cutting Diamonds thus inaugurated may still be seen in numerous jewels dating from the next century. The only patterns known to Kentmann, writing in 1562, are the *Demant-punkt* and the *Demant-tafel*. The first, the *Point* (a name still in use), is a four-sided pyramid, produced by simply polishing the faces of the native octahedron, and making them exactly true and regular. The other, the *Table*, required much more work; the apex of the crystal being ground down to a square, or oblong,

* Laborde's argument will be found stated at length, and more fully answered, further on, in the section where we come to treat of the actual operation.

plane, the opposite extremity being likewise reduced to a plane, but of much smaller area; the sides were brought to a right angle with each other; this proportion being observed, that the width of two sides added together should equal that of the upper plane surface, which gave the pattern its name of the *Table*. But if the stone were a *Lasque* (a flat, shallow parallelogram), then the lower portion was dispensed with, and the *Table* consisted of nothing more than the top and the upper sloping sides, nothing being left below the setting edge, or *girdle*. These proportions are taken from De Boot, who, writing some forty years after Kentmann, observes that although the *Point* was the most frequently seen (as the view of any collection of Cinque-cento jewels will confirm) yet the *Table* was considered of much higher value. This latter pattern was indeed no novelty, it had long been a favourite with the mediæval lapidaries for cutting all the softer stones. Often by slicing off the corners of the square they produced the octagon, a form then highly in vogue on account of its Pythagorean mystic virtue: and antique gems thus reshaped frequently occur in the signets of the times. The pieces of rock-crystal mounted in the huge Papal *credential rings* of the same period are cut as regular tables. The harder stones, like the Sapphire, were, as in antiquity, polished with more or less regularity into a double-convex form, now termed cut *en cabochon* (from *cabo*, a head), known to the English trade by the homely but expressive name of *tallow-drop*.

The seventeenth century introduced several novel patterns into the *atelier* of the diamond-cutter. De Laet, writing in 1647, thus notices the great advance the art had made in his own times. "The industry of these diamond-workers has of late years made very great progress, so that they no longer require the aid of such

elaborate machinery as is figured by De Boot. Besides, they have discovered a mode of *dividing* the Diamond into two or more parts; nay, more, with a boldness that is usually successful, of *cleaving* it, whenever necessity so requires or the hope of profit tempts them; for by this expedient they produce two and sometimes three Diamonds out of one, and likewise extirpate any flaw that lies inside and would spoil the beauty of the entire gem. The cutting through the Diamond is performed by means of a fine wire smeared with oil and Diamond-powder, which is worked to and fro like a saw: an instrument most elegantly adapted to its purpose. Of *cleaving*, the process is somewhat more expeditious, but, at the same time, more hazardous; although now-a-days they are so expert at this art as very seldom to fail." But as regards the *patterns* then in use, they were confined still (as fifty years before) to the *Point* and the *Table*; which he describes, giving their proportions in virtually the same terms as those above quoted from De Boot. De Laet, however, adds one remark of interest in the history of this art. "The *Lasques*, inasmuch as they have not sufficient thickness (for the patterns just mentioned) are formed into imperfect shallow *Tables*; or else they are reduced into the outline of a rose, or a heart, or a triangle, or a shield, and are diversified, but only on the surface, with several *triangles* * or *lozenges*, which gives them remarkable effect, and by this means the stones make a show of much greater weight than they really possess. But in *old times*, when these gems were rare importations into Europe, the jewellers used to shape and polish them in pretty nearly the *same form in which they were found naturally*, as one may see in old-fashioned necklaces, in which you will find

* Triangular facets, called now *skull-facets*. This is the first notice of European faceting to be found anywhere.

ships, with their masts and yards, and similar devices, done with extraordinary ingenuity; but now that Diamonds are so plentiful, the workers do not pay that attention to economy, but shape the stone by cutting."

So far we have proceeded on sure ground: the origin and the date of the other patterns is more a matter of conjecture. The regular *Rose*, a hemisphere covered with small facets, is *supposed* to have been invented at Paris about the middle of that century under the auspices of Cardinal Mazarin, a great amateur of Diamonds. This opinion was first started by Caire, but must be received with all the caution necessitated by the national *penchant* for claiming every elegant discovery in art for France. It is much more probable that it was an *Italian* improvement upon a very old *Indian* fashion. We have seen *Borghis*, the *Venetian*, cutting Shah Jehan's monster Diamond into a true *Rose* before the date of 1665. The Orloff, undoubtedly an Indian-cut stone, is likewise a regular, though exaggerated, *Rose*; and, if there be any truth in the tale as to its original destination, must have been shaped before the era of the Mogul conquest of Hindostan. The greater part of Aurungzeb's Diamonds are also described by Tavernier as rose-cut. Now, these all came to him from his father, as he was no purchaser himself of such trifles. For the understanding of the patterns known in this century nothing can be more instructive than Tavernier's plate (II. 374) of the twenty largest diamonds brought from India by him, and sold to Louis XIV. in 1668 (who ennobled him for his successful execution of his commission). Some are cut like the ancient deep Table, and aptly termed in French *cloux*; others are Tables wanting the under-plane; one is cut precisely after the fashion of the *Koh-i-noor*; another, very deep, has the outline of a *brilliant*, but is surrounded with little

facets,—a novel and elegant idea; two are perfect *brilletes*; the last, of $31\frac{9}{14}$ carats, a deep *Rose*.

But to return to Europe. It is certain that Mazarin ordered the twelve largest crown diamonds to be re-cut after a *new fashion*, which fashion Caire plausibly enough *supposes* to have been the covering them all over with numerous little facets. Of this pattern the Sancy is a good example; so is the Austrian Yellow Diamond, which last is known from Tavernier's drawing of it to have been so cut prior to 1660, but when or where cannot be discovered. These twelve diamonds of the Crown went afterwards by the name of *Les Douze Mazarins*. They have all vanished: the last of the number is entered on the Inventory of 1792 as *Le dixième Mazarin*, weighing 16 carats and valued at 2000*l*. It is described amongst the *brilliantes* as being of "forme carrée arrondie, de bonne eau, vif et mal net, fort épais."

The last and crowning invention in the art was that of the *Brilliant*, in the last years of the same century, which is due to Vincenzio Peruzzi, of Venice, a city then the chief seat of the business in Europe (Tav. ii. 343). This person, by means of experiments upon coloured stones, discovered what are now held the true principles of cutting the Brilliant (*Brilliant récoupé*), which is the ancient deep Table, modified by receiving 32 facets above and 24 below the girdle of the stone.*

The foregoing details are not of mere antiquarian curiosity: they possess a certain practical value in these times, when the jeweller's-work of the Renaissance is sought after with the same avidity as any other production of that tasteful era. To meet the ever-growing demand, regular manufactories of Mediæval as well as Renaissance

* These technical terms will be explained further on, when the actual operation of cutting is described.

jewelry are fully employed at Paris and, more especially, at Frankfort-sur-Maine. It is obvious that one certain criterion for detecting such fabrications would be the discovery in them of stones cut after a pattern not yet invented at the period from which they claim their descent. Ordinary forgers do not possess sufficient historical knowledge to put them on their guard against this test, and consequently many elaborate, pretentious *antiques* are betrayed at first sight by the appearance in them of cut Diamonds that had no business there. But the workers of the Frankfort fabrique are grown wise by long practice, and keep (as I am credibly informed) an agent in London, and doubtless in other capitals, with standing orders to buy up at a certain price all the old Tables and Roses that may come into the market.

ENGRAVED DIAMONDS.

The capricious and misdirected ingenuity of the Cinquecento artists, ever seeking glory in the overcoming of difficulties before held insuperable, speedily distinguished itself by producing *intagli* upon the Diamond. If, indeed, any credit is to be given to the express statement of Garzoni (*Piazza Universale*, p. 550), the very first efforts of the newly-resuscitated Glyptic Art had essayed the conquest of the most invincible of gems; for, according to his account, Caradosso the Milanese, engraver to the Mint to Julius II., had executed upon a Diamond the figure of a Father of the church for that pontiff as early as the year 1500.

Although many of the works celebrated under this name may in reality have been done in the White Sapphire or in the blanchéd oriental Topaz, yet Clusius, a most competent judge, speaks to the fact that Clement Birago

had engraved upon a Diamond a portrait of Don Carlos, intended for a betrothal present or *gage d'amour* to Anna, daughter of the Emperor Maximilian II. This work was actually seen by Clusius during his residence in Spain in the year 1564. Birago had also engraved on Diamond the arms of Spain as a signet for the same ill-fated prince.

The discovery of the method of executing such engravings is assigned by Paolo Morigia, in his 'Nobilite di Milano,' to Trezzo, the famous cameo-artist of that city, and his first essay on this stone was the coat of arms of the Emperor Charles V.; adding that Birago, a pupil of Trezzo's, afterwards engraved on a Diamond the portrait of Don Carlos, the Prince of Spain. Ælius Everhard Vorstius, physician to Maurice of Nassau, and therefore a contemporary and trustworthy authority, in his Preface to 'Gorlæi Dactylitheca' (published first in 1601) repeats Morigia's statement as to Trezzo's (*Treccia's*) being the first inventor, and having cut on a Diamond the arms of Philip II. Gori ('Hist. Dactyl.' 186) says that Jacobus Thronus (who, judging from his name, was a Hollander) engraved "*eximia arte*" on a Diamond, the arms of Philip's consort, Queen Mary of England. In the very miscellaneous collection belonging to a Mr. Peter (sold at Christie's, June, 1859), Lot 206, is: "A gold ring, set with a large square Diamond, engraved with the arms, crown, and cypher, of Mary Queen of Scots." *

To come to more recent times: in Her Majesty's collection of gems is preserved the signet-ring of Charles II. when Prince of Wales, bearing for device the ostrich-

* Many sacrifices have been made to devotion, but certainly never one so brilliant as the cutting of an entire Diamond into the figure of the cross, the unique example of which is to be seen amongst the Hope jewels.

plumes between the letters C. P. very neatly cut upon a large yellow Diamond, a table $\frac{1}{2} \times \frac{7}{8}$ inch in dimensions, quaintly fashioned into a heater-shaped seven-sided shield. This very interesting "historical relic I had the opportunity of myself carefully examining in the summer of 1861. Raspe quotes (p. 590) a Head of Posidonius from the Bedford Cabinet, which he ascribes to the Cav. Costanzi (who flourished at Rome in the beginning of the last century); "who distinguished himself by many engravings upon the Diamond (particularly a Leda, and a Head of Antinous), almost all of which are now (1790) in the Cabinet of the King of Portugal." Mariette also cites a Head of Nero by the same master, done for the Prior Vaini of Florence; and Raspe again, catalogues another head of the same Cæsar, also in Diamond, then in the possession of the notorious Count Brühl.

B. Hertz, in his Catalogue of the Hope Precious Stones, describes two engraved Diamonds: one the bust of the Emperor Leopold I. on a large table Diamond, well executed, and the intaglio highly polished within; the other the Head of a Philosopher, but a very inferior work compared with the first. From Hertz's profession (of a Diamond-merchant) his opinion may be relied on as to the nature of the stones in question. A competent judge has also assured me that the Mayer Collection includes another portrait of Leopold on a true Diamond, a large table. This probably is the very one Raspe mentions as seen by himself in the year 1772 in the hands of a M. Israel, of Cassel. The gems of the Prior Vaini added by Gian Gastone, the last of the Medici, to the Cabinet of the *Galleria*, included several heads by Costanzi, who appears to have wasted his time and real talent upon these truly "*difficiles nugæ*," both in Diamond and in Ruby. They, together with all those elaborate specimens of old Italian

taste, the Cinque-cento rings, disappeared in the disastrous robbery of the *Galleria delle Gemme* in the summer of 1860.

Louis Siries, goldsmith to Louis XV., but domiciled at Florence, is also reported to have done some intagli in Diamond, an attempt to which he would naturally be led by the guiding rule of his career in art, the determination to achieve impossibilities; so highly lauded by his admirer and biographer Giulianelli.

To this list I have been enabled to make some interesting additions, thanks to the politeness of Messrs. Hunt and Roskell, who gave me the opportunity of minutely examining three engraved Diamonds in their possession (July 14, 1865). The first of these is a head of Nero, a perfect likeness admirably executed, upon a comparatively large scale, and the intaglio fully polished on the inside. The stone is of a brownish tinge, and in shape an irregular table, with the edges faceted. The circumstances of the case make me inclined to suspect that this may be the actual work of Costanzi's above described. The second intaglio is in some respects more noteworthy, its date being decided by its setting, a magnificent enamelled ring, in the best style of the Renaissance. On the *reverse* of the stone (a table, of fine water), and therefore appearing through it, are cut two hearts, conjoined with flames arising from them; a device betokening the ring to have been the betrothal gift of some prince of that epoch. The intaglio is beautifully done and brought to an exquisite polish: its style is exactly what one would look for in work from the inventor of the art, Trezzo. The ring may, therefore, without too much straining of probabilities, be conjectured to have conveyed the plighted troth of his royal patron in some one of his repeated wooings.

The third, a regularly cut brilliant, and therefore pos-

terior in date to the opening of the last century, presents upon its upper table a very minute head of Julia, daughter of Titus, slightly scratched in, in an unfinished manner, and without any internal polish.* Its microscopic size and general sketchiness agree so closely with those characterizing the other *tours de force*, the signed works, of Louis Siries, that I have little hesitation in assigning to that over-refining Frenchman all the credit of this performance.

"In tenui labor, at tenuis non gloria,"

was the belief of the skilful artists who expended such an infinity of pains upon the pieces above noticed, and in their day they had their reward in the unbounded admiration of their contemporaries. I shall conclude my notice of the subject, which I have endeavoured to make as complete as possible, by introducing one work of the kind, upon which the Scottish Horace has bestowed poetic immortality (BUCHANAN, *Hendec. XI.*):—

'Adamas in cordis effigiem sculptus, annuloque insertus, quem Maria Scotorum Regina ad Elisabetham Anglorum Reginam misit anno M.D. LXXV.'

"Non me materies facit superbum,
Quod ferro insuperabilis, quod igni,
Non candor macula carens, nitoris
Non lux perspicui, nec ars magistri,
Qui formam dedit hanc, datam loquaci
Circumvestit eleganter auro :
Sed quod, cer Dominus mea figura
Tam certe exprimo, pectore ut recluso
Cor si luminibus queat videri,
Cor non lumina certius viderent.
Sic constantia firma cordi utrique,
Sic candor macula carens, nitoris
Sic lux perspicui, nihil doli intus
Celans; omnia denique ceque præter
Unam duritiem. Dein secundus
Hic gradus mihi sortis est faventia,

Talem Heroida quod videre sperem,
 Qualem spes mihi nulla erat videndi,
 Antiqua domina semel relicta,
 O si fors mihi faxit, utriusque
 Nectam ut corda adamantina catena,
 Quam nec suspicio, æmulative,
 Livore, aut odium aut senecta, solvat !
 Tam beator omnibus lapillis,
 Tam sim clarior omnibus lapillis,
 Tam sim carior omnibus lapillis,
 Quam sum durior omnibus lapillis."

Ep. I. 59, 'De Adamante misso a Regina Scotiæ ad Reginam Angliæ' thus varies the conceit :—

"Hoc tibi quæ misit cor, nil quod posset, habebat,
 Carius esse sibi, gratius esse tibi.
 Quodsi forte tuum ipsa remiseris : illa putabit
 Carius esse tibi, quam fuit ante sibi."

Where this remarkable example of the *ἐχθρὸν ἄδωρα δῶρα* now exists I have been unable to discover. It is not to be found amongst the Royal Gems.

NATURAL PROPERTIES.

The Diamond is highly electric, attracting light objects when heated by friction ; and alone amongst gems has the peculiarity of becoming phosphorescent in the dark, after long exposure to the sun's rays.* The Romans attributed magnetic powers to the Diamond in a far higher degree than to the Loadstone ; so much so that they believed the latter was totally deprived of all its effect in the presence of the Diamond ; but this notion is quite ungrounded. Their sole idea of magnetism was that of attractive force : seeing therefore the stone possessed this for certain objects, the step to ascribing to it a superiority in this, as in all other respects, over the Loadstone, was easy to their lively

* Or steeping in hot water, says Boyle.

imaginations, unfettered by experiment. This connection of ideas is still perpetuated in the French word for Loadstone, "Pierre d'Aimant," from the low Latin "petra de Adamante," which in another form gives "Diamant." The Orientals, improving upon this notion, assigned to the Diamond a *discriminating* magnetism consistent with its own pre-eminent dignity; for Ben Mansur states, "the Diamond has an affinity for gold, small particles of which fly towards it. It is also wonderfully sought after by ants, which crowd over it as though they would swallow it up."

Though an antidote against all poisons when worn on the finger, yet during the Middle Ages it was considered the most deadly of all if swallowed. This is laid down as an indubitable fact by the eminent physician Camillo, writing in 1502. Thus Cellini tells how his life was preserved from the machinations of his enemy P. L. Farnese by the roguery of the apothecary, who, being employed to pulverize a Diamond intended to season the artist's salad, substituted a bit of "*citrino*," beryl, in its stead. It is likewise enumerated amongst the poisons administered to Sir T. Overbury when a prisoner in the Tower. Garcias takes some pains to overthrow this long-established opinion, by quoting instances of slaves in the mines swallowing large Diamonds, for the sake of embezzling them, without the least injury to their stomachs: and a woman (in a case known to him) had administered doses of diamond-dust for many days continuously to her husband labouring under a dysentery (not as it seems for the sake of putting him out of his misery but on homoeopathic principles) without the slightest effects either good or bad.

* DIAMOND-CUTTING.

Laborde ('Glossaire,' p. 250) labours hard to claim for his countrymen the invention of Diamond-cutting, and at

an earlier period than Berquem's. It is therefore worth while to examine the strongest of the documentary evidences he there adduces to support his assertion :—

"A.D. 1407. La Courarie, où demeurent les ouvriers de dyamans et d'autres pierres" ('Description de Paris,' par Guillebert de Metz). Item. (Dans une vue generale des plus habiles ouvriers de Paris) "plusieurs artificieux ouvriers comme Herman qui polissent dyamans de diverses formes."

1412. "Un anel d'un dyamant gros, de quatre losanges en la face dudit dyamant, et de quatre demi-lozanges par les costez dudit dyamant; l'autre dyamant plus petit, plat, de six costez; l'autre dyamant un petit moindre, et est en façon d'un fleur de 'souviegne-vous-de-moy,' et est de quatre pieces; et l'autre dyamant est un petit moindre sur la rout" (Duc de Bourgogne, 181).

1432. "A Jehan Pentin, orfèvre et marchand de joyaux, demeurant à Bruges, pour un anel d'or esmaillé et garny d'un gros dyamant à façon d'escusson. . . . vixx salus" (Do. 1088).

"A Huart Duvivier, aussi marchand de joyaux, pour ung aultre anel d'or garny d'un dyamant à plusieurs faces. . . . xvi salus" (Do. 1091).

Now it will be observed in these extracts that not a word is said of *cutting* Diamonds, but only of *polishing** them—a process perhaps known from the very earliest times, and merely consisting, it may be presumed, in freeing the native crystal from the gum-like coating that in so many cases totally veils its transparency. This could very well be done by means of emery-powder alone,

* The same idea is expressed in the Flemish name for the trade, "diamant-slypers," found in a cause tried A.D. 1465, about an Amethyst sold at Bruges for a Balais.

though a somewhat tedious operation. As for the "faces" quoted by Laborde as meaning *facets* cut by art, it is almost demonstrable from their arrangement specified that they were no more than the natural faces of the crystal. The term 'taillé,' be it observed, is not once used in the original text. The stone "in the fashion of a forget-me-not" is actually described as formed out of four—that is, four small Diamonds set in the shape of that flower; and the "escutcheon-shaped" may well have been only a native flat stone. It may be confidently asserted that no mediæval ring, of a make earlier than 1470, can be produced, set with a Diamond that appears to have been *artificially cut* to any pattern, however simple.

As for the French origin of the art, some of his examples are but ill-chosen for his case. The name *Herman* bespeaks a Teutonic origin; and another of the jewellers is mentioned as resident at Bruges. His three *experts* too, the "diamant-slypers," are all Flemings.

Laborde makes several objections to the received account of L. de Berquem's discovery. First, that De Boot, himself from Bruges, says nothing about it. But his silence in this case proves nothing, inasmuch as he never has named (it not entering into his plan) the authors of many other inventions cited in the course of his treatise. Again, "that the name Berquem rarely occurs in the registers of the city of Bruges;" but if it *does* occur at all, that suffices to establish the existence of such a family there. Lastly, he makes merry at the idea of Charles* losing at *Granson*, in March, 1475, a Diamond which was cut by Berquem in

* Laborde, like most people now-a-days, appears to be utterly ignorant that March, 1475 (o.s.) would be the last month of that year, which by the old mode of reckoning time began on Lady-day, and therefore answers to March, 1476, n.s.

1476, the year after; but this, intended for a knock-down argument, is based upon a misquotation of his own, as shall be pointed out a little farther on.

The story about L. de Berquem, and his accidentally discovering, by rubbing two Diamonds together, that one would bite upon the other (the true principle of diamond-cutting), rests solely upon the authority of Robert de Berquem, calling himself his descendant, who, two centuries after his epoch, in the year 1669, being established in Paris in the same line, as goldsmith and jeweller, published a treatise on precious stones, entitled '*Les Merveilles des Indes Orientales.*' Let us see what he really does say:—"Au même temps Charles, dernier duc de Bourgogne, à qui on avait fait récit [of this discovery] lui mit trois gros diamans entre les mains, à les tailler avantageusement, selon son adresse. Il les tailla dès aussitôt; l'un espais, l'autre foible, et le troisième en triangle:* et il réussit si bien que le duc, ravy d'une invention si surprenante, luy donna trois mille ducats de récompense. Puis ce Prince, comme il les trouvoit tout à fait beaux et rares, fit présent de celui qui étoit foible au pape Sixte quatriesme: et de celuy en forme d'un triangle et d'un cœur, réduit dans un anneau et tenu de deux mains, symbole de foy, au roy Louis XI., duquel il recherchoit alors la bonne intelligence. Et quant au troisième, qui étoit la pierre espaisse, il le garda pour soy, et le porta toujours au doigt, en sorte que il l'y avoit encores quand il fut tué devant Nancy, un an après qu'il les eut fait tailler: sçavoir, est en l'année mil quatre cens soixante dix-sept."

It will be remarked here that R. de Berquem makes Charles lose the Diamond with his *life* at Nancy, not with

* The rough stones were, one deep, the second thin, the third triangular.

his *baggage* at Granson, two years before; and thus the anachronism which Laborde ridicules does not in reality exist in the story. But after reading the accounts above cited from Charles's contemporaries, Comines and J. J. Fugger, it is clear that the Duke's "famous and fabled Diamond" was only one, and *that one* was lost at Granson.* Robert, writing at that distance of time, and, like everybody else then, knowing nothing of mediæval fashions, naturally enough makes Charles wear his splendid Diamond in a ring, as everybody was doing in 1669, not in a pendent jewel, an ornament so long obsolete; and just as naturally represents him as keeping to his death this last relic of his fortunes. All these inaccuracies are such as creep into family traditions, without invalidating the main facts of the story. But if Louis did in truth cut the stone to that novel and skilful pattern copied by Fugger, and received that munificent reward for his invention, mentioned by Robert, it must have been before the disaster of Granson, after which date the Duke had neither money nor inclination for such articles of luxury. This trifling anachronism of Robert de Berquem's seems to be the sole foundation for a second legend, also retailed by writers on precious stones *usque ad nauseam*, which converts his Nanoy Diamond into another than the Nanoy. According to this version, the Duke's corpse, stripped and frozen into the mud of a ditch, was only recognised by his grand Diamond (a very unlikely article, by the way, to have escaped the notice of the spoilers); which jewel falling into the hands of the Lucernese was sold by them for 8000 Rhenish florins to Wilhelm von Diesbach, and after

* Comines' words are "Son gros Diamant qui estoit un des plus gros de Chrestienté." Adding that in the same rout "furent perdues toutes les grandes bagues (jewels) du dit Duc." Whence it follows that no Diamond of any importance was left to him to lose at Nanoy.

passing through half-a-dozen more hands, doubling its price at each change of ownership, came into the possession of Pope Julius II. for the sum of 30,000 ducats, who placed the same in his tiara. Others again make this the identical Austrian Yellow Diamond, which the reader must be reminded is actually thrice the weight of the largest Diamond known in the middle of the next century ! Besides Charles had lost "toutes ses grandes bagues" at Granson. As to the recognition of his corpse, naked and crushed ; that was done, says Comines, by an Italian his page, and by his Portuguese physician, Luppa, from their knowledge of his person. The Duke did indeed wear a ring upon the day of his death, though not on his finger, neither was it a gem ring but his privy signet. Comines' own words with their quaint conclusion ought to set this matter to rest for ever :—"J'ay depuis veu un *Signet*, à Milan, que maintes fois avoye veu pendu à son pourpoint, qui estoit un *anneau* et y avoit un *fusil* * entaillé en un *camayieu* où estoient ses armes ; lequel fut vendu pour deux ducats au lieu de Milan. Celay qui le lui osta lui fut mauvais valet de chambre !"

The capricious form recorded to have been given to the third stone, the "triangle and heart" combined, has a striking analogy with the ingenuity displayed in the devising of the figuration of the first. As yet the inventor had no idea of improving the lustre of the Diamond : his object was to display his victory over the hitherto invincible material.†

* "Fusil" or "Spindle," heraldic, in shape an elongated lozenge. The 'Camayieu,' or Onyx may be supposed the German sort then in fashion, says Agricola, for engraving arms upon in Germany.

† It was not before the *rose*-pattern was invented that the *brilliance* of the Diamond was much augmented by the cutting. For that, the old jewellers depended upon the *tinctura*. The table-cut stone of De Boot's times merely gained regularity of form and polish from the *cutting*.

Barbot ('*Taille du Diamant*') considers it an absurdity to suppose that the action of one Diamond upon another could have been discovered by accident, so much force being actually required to make one bite on the other. This is true for the *effective* operation, but the idea of their possessing such power may very possibly have been suggested by observing the effect of slight and casual friction. Like a true Gaul, Barbot solves the difficulty by making Berquem go to Paris to study the art under Herman!

Laborde, to prove the antiquity of the art of *diamond-cutting*, adduces the use of the diamond-point by the ancients for engraving gems.* This is totally foreign to the purpose: nothing could have been done in the way of reducing the Diamond to any given shape until the secret was discovered how to get the *diamond-dust* to replace the emery, that agent only effective for the softer gems; and this diamond-dust could only then be obtained by rubbing one stone against the other; there was as yet no supply of small Diamonds good for pulverisation alone. This then was the grand discovery of L. de Berquem; and until a genuine piece of mediæval jewelry be produced, containing a Diamond actually cut to a definite pattern, there is no reason why he should be robbed of the honour he has so long enjoyed.

In the modern art the first principles are the same. The stone, if of a very irregular formation, is brought towards its required shape by cleavage. A nick being scratched with a diamond-point along the direction of its laminae, a smart blow with the knife severs the projection, which can subsequently be itself cut into a shapely stone of ap-

* Whether the ancient "*crusta adamantis*" was a splinter of Corundum (which is the most probable) or of the true Diamond, it was always set in an iron handle for use; a different thing altogether from using the dust applied to the wheel in lieu of the *smirra*.

preciable dimensions and value.* The next process is the rough-sketching of the required form, appropriately termed in French *brutage*, and also *égriser*, "to sober;" a jocular term at first, now become technical; hence *égrisée*, the French name for the diamond-dust. Two Diamonds of nearly equal size are cemented each in a handle, and rubbed one against the other until one facet of equal extent is mutually ground out of the surface of each. The powder as it falls is received in a box, and becomes the essential agent in the next operation. This is the polishing, performed upon a disk of soft iron about a foot in diameter, made to revolve most rapidly (thirty times in a second) in a horizontal plane, and having its surface covered with the diamond-dust† mixed with the finest olive-oil. The Diamond is embedded in soft solder in a socket at the end of an iron arm, leaving but so much of its surface exposed as is required to be acted upon. By placing weights on the extremity‡ of this arm (that touching the wheel), it will be seen that the necessary degree of pressure is obtained for keeping the stone tight against the revolving disk below. In this way two or three Diamonds are operated upon at one time, the workman repeatedly examining each; and when a facet is completed he extracts the stone, and rebeds it in the solder so as to present another portion to the action of the cutting surface. All this is done entirely by the eye; for it is by constant practice that the secret is learnt of cutting the numerous facets with such invariable

* Receiving 6, 8, or 12 facets, according to their extent, they come into the market as *Antwerp roses*. The true rose has 24 facets, and is known as the *Dutch*.

† For the rougher part of this operation they now largely use the Brazilian Carbonado, formerly called the Black Diamond, and the rarest of the species, but of late years found in abundance and in large masses.

‡ In cutting the Koh-i-noor, the weights applied ranged from 1 lb. up to 15 lbs., according to the velocity at which the wheel was driven.

exactness. And this dexterity may be estimated from the almost incredible fact that perfect *Roses* are cut so small, that 1500 go to the carat! In former times the wheel was put in motion by a treadle, and each man worked at home: at present the master supplies the steam-power, and numerous wheels are set going in one large room. This business is almost confined to the city of Amsterdam: it is entirely carried on by Jews, and the number of them engaged in it there is about ten thousand.

The *rose*, brought to a more or less convex form, has the surface cut into twenty-four little facets, while the base is polished and remains a plane. This, with the *table*, were the only patterns known during the seventeenth century, and the first quarter of the next. Even in jewellers' work of the reign of Queen Anne they alone appear, as for instance in certain jewels made by her order for the Duke of Marlborough, as I have been informed on the best authority. It is the opinion of the same most competent judge that the latest and most perfect of all—the *brilliant* pattern—was introduced some time in the reign of George I., which agrees pretty nearly with the date Caire assigns to Peruzzi's invention. In this the Diamond is made to assume the form of two cones united by their bases; the upper cone so much truncated as to present to the eye a considerable plane surface; the lower but slightly so, terminating almost in a point. Thus the stone, being set with the broader plane uppermost, possesses great relative depth, which, strengthening its refractive power, aided also by the numerous facets that cover the sides, both combined mightily augment the brilliancy of the Diamond (whence the name) by confining the rays of light inside it.*

* Jeffries as late as 1750 deprecates the "newfangled mode of brilliant-cutting," and oddly uses against its adoption in England the *argumentum ad misericordiam*: saying, what indeed proved very true, it would vastly

In the technical description of the *brilliant* ("brilliant *récoupé*"), the upper surface is the *table*; its sloping edge, the *beasil*; the junction of the upper truncated pyramid with the lower, or the broadest part, the *girdle*; the lower pointed portion the *pavilion*; the bottom plane, the *collet* ("culasse"). Between the table and the girdle are 32 facets; below the girdle 24. Facets are named from their forms, *star-facets*, touching the table; the rest, the upper and lower *skill-facets*; or as the French term them, "*dentelles, losanges, feuillets*." As a rule, small stones lose 38 or 40 per cent. of their weight, large ones 50 and even more, in being reduced to this form; but in the old perfect Indian octahedrons the loss was much less, the crystal naturally lending itself to the shape.

Tavernier gives (ii. 373) a very instructive drawing of a monster rough stone weighing $157\frac{1}{2}$ carats, bought by him at Amadaboo for a friend: and again of the same when cut, at the same place one must infer. It is reduced to an almond shape, facettèd on both sides, the exact figure of the Sancy, and to the weight of only $94\frac{1}{2}$ carats, showing the immense waste entailed by this pattern. According to this rule, the unlucky Borghis was not so very culpable in his diminishing the weight of the Mogul: in fact the waste in the latter case was considerably less.

During the last century the chief seat of the business of diamond-cutting for the world was London; and even now an old town-cut brilliant can immediately be distinguished from those prepared by the modern Dutch (who sacrifice beauty of form to preservation of weight), by the superior accuracy and excellence of the work, and consequently it

diminish the value of family jewels if it became universal. But fashion has no bowels of compassion: so the old Roses were forthwith re-cut into brilliants despite the dreadful sacrifice of weight, and Tables became almost valueless.

commands a far higher price in the market; for the lustre of a brilliant depends in great measure upon the judicious distribution and accurate finish of the facets composing its sides.

De Boet, who, assisting his imperial master, worked long and sedulously at this art, has left many curious details of the process as carried on in his times. He gives a figure of an ingenious contrivance invented by himself for cutting several stones at once. It may be briefly described as a horizontal, circular frame, perforated with sixteen holes, which received as many handles, on whose ends the diamonds were cemented.* These handles, by weights applied at top, kept the stones in close contact with the wheel revolving below horizontally, which was a mere rim of pewter equal in circumference (three feet) to the frame above, and provided with a border to keep the diamond-dust and oil with which it was moistened from falling off. As may be supposed, from want of motive power (the machine being driven by the foot like a turner's lathe), the operation was very slow: he mentions that it was only necessary to unbed each stone once a week. But it must be borne in mind no cutting of facets was as yet attempted: the wheel had only to attack the large and simple planes of tables and of pyramids. He knows nothing of the *brutage* or preliminary shaping of the stone, but states that this pewter wheel was employed for cutting down the Diamond as well as for polishing it. The diamond-powder was then obtained by breaking up inferior stones with a large hammer: its value was ten thalers per scruple. But in the next fifty years such rapid progress had the art made that De Laet describes the *brutage*, and the subse-

* The cement then used was made of turpentine, pounded brick, and hard pitch. De Laet's recipe is, very finely powdered brick-dust and resin, the strongest cement invented.

quent bedding in solder for the finishing operation in nearly the same terms as I have already used. It was only in cases where there was danger of flawing the stone, that the lapidary entirely depended upon the slow, but safer, operation of the ancient process. The wheel then used was of the finest steel. De Boot notes that a perfect table Diamond of one carat then sold for fifty ducats, and he supplies a table constructed after a somewhat complicated theory for ascertaining the value in proportion to the weight; but the result approximates pretty nearly to the modern, viz., to square the number of carats, and multiply the sum by the selling price of a stone of one carat. For example, supposing the latter to be 8*l*. (as it was for many years before 1850), the value of one of 5 carats* would be $5 \times 5 = 25$, which multiplied by 8 gives 200*l*. (Barbot states the selling price of a perfect brilliant one carat weight in Paris (1858) as 300 to 320 fr., 12*l*. to 14*l*.) For about a century, the price with slight fluctuations remained as laid down by Jeffries in 1750, viz., at 4*l*. for the rough Diamond, 6*l*. for the Rose, and 8*l*. for the Brilliant. But ever since 1850 there has been a gradual rise, estimated

* Few of my readers know the origin of the word carat. It comes from *καράιον*, a kind of vetch, the seeds of which, running very uniform, furnished natural weights for estimating the value of small and precious articles to the Orientals; just as barley-grains afforded the unit of weight and of measure to the Europeans. A carat weighs 4 grains French, or $\frac{3}{4}$ Troy. Carat, moreover, is used in another sense in speaking of the precious metals; standing for an imaginary division of the pound Troy into 24 parts; and the standard is expressed by naming how many of those parts the pure metal forms, the remainder being understood as the alloy. Thus the standard of the sovereign is 22, or two parts alloy; of watch-cases, Hall-marked, 18, or six alloy, i. e. one quarter of the mass. The latter is the lowest standard permitted by law in France, where certainly "they order these matters better" than with us.

by Emanuel at ten per cent. each year, so that he puts down the selling price for the year 1865 at 18*l*. This only applies to small stones; specimens of unusual size, from the difficulty of finding purchasers, necessarily have their value calculated by other rules. In the suit '*Van Minden v. Pyke*,' referred to above, it was stated in the evidence, that Diamonds had risen 25 per cent. in value since the year 1861, and large stones in even a greater proportion. This rise may be attributed to many causes, the diminution in the value of gold, the extinction of the supply of Indian Diamonds, and the constantly decreasing productiveness of the Brazilian mines; whilst on the other hand the demand for them daily augments through the craving after this outward and visible sign of opulence in the mushroom growth of '*nouveaux riches*' that has sprung up within the above-named space of time, both here and, with even more marvellous rapidity of vegetation, in the *salons* of Paris.

The grand test with the jewellers of olden times for distinguishing the real Diamond from the spurious, of which so many were then current, as the White Sapphire, the Citrine Beryl, and the Crystal cut into a pyramid, was to ascertain whether it would "take the tincture." This was a varnish made of ivory black and mastich applied to the back of the stone, which, if a true Diamond, obtained vast brilliancy from this background; but if any other gem, became dull and lustreless, shewing the black through its substance. Some used the oil exuding from a roasted grain of wheat darkened with ivory black, others backed the stone with a bit of black silk. An ingenious, and often too deceptive mode, of evading this test was to set the imitative Diamond with a vacancy between its "*culasse*" and a black back-ground, the air confined in this space preventing the rays of light from being stopped too suddenly by the

ground. Other cheats substituted as the backing a bit of looking-glass. To set the Diamond transparent was never thought of before our times. This varnish was necessarily impaired by heat; and therefore it was the practice to deposit, on going to bed, one's diamond ring in a glass of cold water, in order to maintain its full brilliancy.

The "Novas Minas" White Topaz of Brazil, called there "Slaves' Diamond," is now the only stone which has any chance of being passed off for the Diamond. It is in truth extremely hard, and very brilliant, but wants the adamantine lustre and the iridescence.

It is a singular proof of the force of long-established fable to find the practical De Boot, though conjecturing, from its analogy to amber in the property of attraction, that the Diamond is "*igneæ et sulfureæ nature*," yet going on asserting that it is not only proof against fire, but even improved by exposure to its action for several days. Exactly a century later, Newton conjectured it to be combustible, because its refractive power, which is to that of water as 1.0396 to .785, so greatly exceeds that due to its density.* Soon after this (1694) Averani burnt a Diamond in the presence of Cosimo III. at Florence; but even then no one thought of performing the operation in the ordinary way: it must needs be effected philosophically by the solar rays concentrated through a burning-glass. At last some one trying the experiment in a smith's forge found the stone converted into charcoal at the melting point

* For the same reason Brewster supposed it to be nothing more than a fossil-gum; and his theory is strongly supported by the existence in such vast quantities of the *carbonado* or amorphous black Diamond, which bears the same relation to the pure species as jet does to amber. This theory has lately been worked out by Professor Göppert of Breslau, in a treatise '*On the Vegetable Origin of the Diamond*.'

of silver only. And in the year 1800 Clausel, Weller, and Hachette, by adding one part of Diamond to sixty of iron, obtained an ingot of excellent steel.

"THE DIAMOND NECKLACE."

As it is truly said that "it is the last straw that breaks the camel's back," so was it the scandal of the famous "Diamond Necklace" that gave the *coup de grâce*, though with great injustice, to the prestige of royalty in France. Briefly to give the main facts of this extraordinary plot: the Cardinal de Rohan, a handsome, conceited, luxurious prince of the Church, had been ambassador at Vienna, and in that capacity had given great offence to both courts by a letter, divulged by Madame Dubarry, containing some satirical remarks, too true for forgiveness or excuse, upon the hypocrisy of the model devotee Maria Teresa. He was recalled, and lived under a cloud in Paris, where he was Grand Almoner to the king. Perhaps he was inspired with a feeling warmer than loyalty by the charms of Marie Antoinette: at all events to regain her favour was the grand object of his life. About this time it happened that Böhmer, the court jeweller, had on sale a magnificent necklace of brilliants, priced at sixteen hundred thousand livres—64,000*l.*, which he had offered to the queen, who had declined the purchase as above her means at the time. Meanwhile the Cardinal, in the pursuit of his one object, had made acquaintance with a Madame de la Motte, a confederate of the notorious quack Cagliostro, who pretended to have great influence with the Queen, and promised to plead his cause with her. To prove to him the reality of her professions, she procured him an interview, one night in August, 1784, in the *bosquet* of Versailles,

with Marie Antoinette herself—that is to say, with a certain nymph D'Oliva, who, in figure and in gait, was almost her Majesty's counterpart. La Motte, having thus effectually won the confidence of the Cardinal, began to represent to him the Queen's intense longing for the necklace, and the favour he would gain with her by effecting the purchase of it, not as a present, it must be borne in mind, but merely to secure the same upon his own responsibility with the jeweller. The Cardinal, therefore, duped by this plausible story, concluded the purchase in February, 1785; the conditions being that the amount was to be paid in four half-yearly instalments of 400,000 livres each. This agreement was supposed to be submitted to the Queen, and was returned approved and signed by her: a forgery by La Motte's husband. The necklace was now entrusted to La Motte for conveyance to the Queen in the manner best calculated to advance her admirer's interests;—it was handed over to her husband, who lost no time in betaking himself and the spoil to London, where he broke up the necklace and converted the brilliants into money. Why Madame did not follow him on the first fair opportunity is a mystery to me inexplicable, unless, indeed, her avarice induced her not to give up plucking so fat a pigeon until the very last moment, and thus caused her to overstay her time. The *dénouement* did not arrive before the end of the first half year, when Böhmer, after a decent delay, ventured to remind the Queen of her agreement, signed with her own hand. Then came a complete *exposé*. The Cardinal was sent to the Bastille, in pontificalibus, just as he was about to sing mass before the court; but after a short imprisonment was released, and sent in disgrace to reside at an abbey of his in Auvergne. Madame La Motte was sentenced to be whipped,

branded on both shoulders, and to be imprisoned for life in the Salpêtrière. She, however, escaped thence in man's attire and managed to rejoin her husband in London, where she died, in 1791, either of a bilious fever, or from throwing herself out of the window in a fit of delirium.

NOTE.—For all the details connected with the present trade in Diamonds, both wholesale and retail, the reader desirous of complete and accurate information can have no better authority than Barbot "ancien joaillier," under "Diamant," in his *Traité Complet des Pierres Précieuses*, Paris, 1858. But the historical portion of that article is full of inaccuracies, as indeed is the rest of his treatise in that particular department: but when it attempts the branch of the subject relating to art and archæology the book is infinitely more defective and swarms with the most palpable blunders: its teaching is only valuable so long as its author, "the retired jeweller," keeps closely within the limits of his *métier*. Much however—and that the best part—of his information has been borrowed without acknowledgment from Caire's *La Science des Pierres Précieuses appliquées aux Arts*, Paris, 1833: now extremely scarce, and therefore liable to be pillaged with impunity. The want, long felt, in our literature of a Handbook on the same principle as Caire's, has at last been well and amply supplied by H. Emanuel in his perfect *bijou* of a volume, *Diamonds and Precious Stones*, 1865.



ARGENTUM: ἄργυρος: *Silver*.

IN the ancient world Silver was to the same extent the peculiar production of Europe, that Gold was of Asia. Herodotus makes no mention of any mines of silver in the latter country, and even expressly notices that the Scythians and Massagetæ, though abounding in gold, had no silver at all. On the other hand, he speaks of Mount Pangæus in Thrace as containing most productive mines of both metals, and mentions a silver-mine adjacent to the Lake Prasias on the confines of Macedonia that used to bring in a talent of metal (60 lbs.) in weight per day to Alexander I. (v. 17): a proof this of the extraordinary richness of the ore, considering the little skill of the Greeks in reducing this metal, and the wasteful process employed.

But the most extensive and richest mines of Silver known to the ancient world were in Mount Laurium, or rather the chain of hills occupying the southern extremity of the Attic peninsula. Xenophon (*De Vectigal.* iv.) describes these mines as having been worked from time immemorial, as was testified by the heaps of rubbish and slag, rivalling in height the natural hills. The earliest coinage known to the world was the produce of these mines, for the old Parian tradition is evidently (on the testimony of the coins themselves) well founded which makes Phidon King of Ægina (B.C. 869) the first that struck coin, that is of *silver*, for some Lydian prince had preceded

him in *gold*. Lucan (vi. 402) quotes a tradition pointing to a not very distant locality, which assigns this invention to Itoneus, a Thessalian king—

"Itoneus first, who in Thessalia reigned,
To take a shape the heated ore constrained;
First by fire's force the silver made to flow,
And virgin gold tamed by the coin-die's blow."

These mines at Laurium were in their fullest activity just before the Peloponnesian war. Xenophon mentions that Nicias (the commander of the ill-starred expedition to Syracuse) kept a thousand slaves there, always maintaining the same number, whom he hired out to a Thracian, Sosias, for one obol per man per day clear of taxes. This net return would make 166½ drachmæ daily (about 7*l.*): a large sum, indicative of a gross result yielding corresponding profits to the Thracian lessee, who had to feed these miners, pay a royalty to the State, and supply all the other expenses of the mining operations. Similarly Hipponicus had six hundred slaves let out at one mina (3*l.* 5*s.*) per day, and Philemonides half that number. These wealthy Athenians were too cautious to embark in mining operations themselves: the actual farmers of the mines were usually foreigners, as in the case named—Thracians, who had studied the business in the ancient workings of their own country. The State encouraged these operations as much as possible by allowing foreigners to embark in them on an equal footing with the natives. These lessees under the State paid their *royalties* in the form of a poll-tax on every slave employed; an excellent plan for preventing their cheating the revenue. Xenophon could devise no better expedient for restoring the dilapidated Athenian finances than that the State should purchase slaves as a national concern (the South Sea *Asiento* antici-

pated) and let them out to the contractors, as the safest and most profitable of all investments of the public money. There was no fear (as he assured them) of the mines being exhausted: no miners had ever come to the end of the veins, however deep they had sunk their shafts, and the entire mountain-range was equally productive wherever opened. Nevertheless, in Strabo's time, four hundred years later, the mines were completely worked out. They had become a thing of tradition by the middle of the second century: Pausanias speaks of Laurium, "where the Athenians had silver-mines formerly."

Diodorus, Strabo's contemporary, contrasts the poverty of the Attic mines in his own times with the certain wealth of the Spanish, saying that mining in the former was a complete lottery ("enigma"), where many were not merely disappointed, but lost all they had in the first outlay; whereas in the latter they make profits beyond their hopes. The woods clothing the mountains having been completely burnt off by an accidental fire (whence called *Pyrenæa*), the silver-ore near the surface was melted, and flowed out in streams. This the Phœnician traders obtained for a trifle from the ignorant natives; and, their ships being overladen therewith, they weighted the anchors with silver in place of the lead originally put in them for that purpose. At last the Iberians set to working the mines themselves. They were of copper, silver, and gold. From the copper-ore they obtained one-fourth pure metal. "Some of the silver-miners get in three days as much as an Eubœic talent (65 lbs.) per man. For the whole ground is full of shining silver-dust. At first the natives worked the mines; but after the Roman conquest a multitude of Italians occupied them. These buy vast numbers of slaves, whom they employ in the works, opening new shafts, sinking down, and driving levels after the course of the

veins, many stadia in extent. The further they go, the more splendid veins do they find, full of silver and of gold. The water flooding their workings they raise to the surface by means of the screw of Archimedes; having a succession of these on different levels, until they bring it up to the mouth of the shaft. The slaves are kept at work both day and night, are cruelly treated, and die off very fast. One singular thing is, that none of the mines are of recent origin, having all been opened by the Carthaginians when masters of the country. By the revenues derived from these mines they were enabled to carry on their long wars against the Libyans, Sicilians, and Romans, entirely by the aid of mercenaries. For of old times the Phœnicians were famous for finding out gain, and the Italians for leaving nothing to anybody else."

To return to Attica, Strabo has a curious note, that, although the Laurium mines were actually worked out, yet the improved state of metallurgy allowed a certain profit to be extracted from remelting the old slag, which had been very imperfectly freed from the metal: a sure proof of the great facility with which it had been raised in former times. This Attic Silver was contained in a lead-ore: the latter metal the smelters could (or chose to) but imperfectly separate, by the tedious process of oxidising it by burning; which accounts equally for the leady appearance of the old Greek coinage, and for Pliny's apparently (to us) preposterous observation that black marks can be made with silver, as with lead, upon any white surface.

Of Silver-mining amongst the Romans a lucid notice is given by Pliny (xxxiii. 31). Silver was found more or less plentifully in every part of the empire; but the Spanish mines bore by far the first rank. These had been opened by the Carthaginians, and were still as productive as ever. That called Bæbalc had yielded to Hannibal, who

discovered it, 300 lbs. in weight per day. By Pliny's date the galleries had been carried a mile and a half into the hill; the Aquitanian labourers, working in spells (the time regulated by the burning of a lamp, "*lucernarum mensura*"), pumped out the water without intermission by day and night in such quantity that it formed a river. "The exhalations from the mines are fatal to all animals, but more particularly to dogs," which shows they were troubled with the choke-damp. Some ore, called "*Cru-daria*," was found immediately below the surface. The earlier miners used to dig no farther after they came upon *alum* (what mineral is here meant is not easy to explain); but afterwards, having discovered that copper lay beneath this, there was no limit to their search.

Polybius (xxxiv. 9) describes the silver-mines near New Carthage as of great extent, occupying a circle of 400 stadia (40 miles), and employing 40,000 miners, who produced to the Roman treasury 25,000 drachmæ per day (or $260\frac{1}{4}$ lbs. Troy).* The ore was broken small, and sifted into water; the sediment again pounded, the operation being repeated five times; the residuum was then melted, and, "the lead being poured off," the Silver was extracted pure. No silver-mines are mentioned by any ancient writer as ever discovered in Italy: so the vast amount of the metal required for the almost unlimited coinage of the wealthy states of Magna Grecia (having no gold currency) and of Sicily must have been obtained in exchange for their exports of grain.

* In estimating the ancient weights it must be remembered that the Greek *Mina*, or pound, somewhat exceeded our pound *avoirdupois* ($14\frac{1}{2}$ ounces *troy*). On the other hand the Roman *libra* was, like that still used there, of 12 ounces *avoirdupois*, and, therefore, about one-tenth lighter than our pound *troy*. This last, it may be remarked, *en passant*, came by its name from being the established weight in use at the great fair of *Troyes* in mediæval times.

Had the Romans been aware of the mineral wealth of Silesia, they would certainly have made more vigorous efforts for the conquest of Germany; but the rich silver-mines of that province were first opened in the 10th century. In Norway also the Kongsberg mine during the last century rivalled in productiveness any of the Mexican.

Silver was never met with Native (adds Pliny), or even betraying its presence, like gold, by particles sparkling in a stony matrix: it only occurred as a reddish or ash-coloured earth. This could not be reduced unless it were mixed either with lead or with the lead-ore, called *Galena* (Sulphuret of Lead), usually obtained in the same mines. (The chief produce of these Spanish mines at present is silver-lead ore.) By the same operation, in the smelting, part of this mineral was reduced to lead, whilst the silver floated on the top, like oil on the surface of water. Pliny (xxxiv. 47) notices the separation of the silver from the lead in the same melting at different temperatures—a property, only recently again taken advantage of in the extraction of silver from argentiferous lead-ore (Pattinson's Process), but thus proved known to the profit of the old Spanish miners. "Lead is either produced pure naturally in an ore of its own, giving nothing else, or else united with silver, and the two ores are smelted together. Of this mixture that which first runs off in the furnace is called 'Stagnum;' the next that comes off is Silver: the residuum in the furnace is *Galena*, amounting to a third of the charge of ore. This melted over again produces Lead, with a loss of two parts in nine." (This residuum, therefore, must have been Litharge, or lead oxidised by the great heat required to smelt the combined ores. As charcoal was the only fuel then used, this oxide gained sufficient carbon in the second melting to convert it into metallic lead.)

A very ancient traditionary process was evidently the method of refining silver used in the Delhi mint, as follows: "They dig a hole, and having sprinkled in it a small quantity of the ashes of field cow-dung, they fill it with the ashes of Babool-wood, then they moisten it, and work it up into the shape of a dish or coppel; into this they put the adulterated silver together with an equal quantity of lead after the following manner: 1st. They put with the silver the fourth part of the lead, and surrounding the coppel with coals blow the fire until the metals are melted. This operation they repeat as often as is necessary, but in most instances four times are required. The proofs of the metal being pure are the brightness thereof, and its beginning to harden at the sides. When it is hardened in the middle they sprinkle it with water, when if a flame issues from it, it is arrived at the required degree of fineness, and if they melt this mass again there will be lost half a *ruttee* in every *tolah* (one part in 192). The coppel becomes a kind of litharge which, in the Hindostani language they call *kehrel*."

The ancients, who classed minerals for the most part by the eye, considered *native* Quicksilver, "*argentum vivum*," as a rare variety of this metal, occurring in the same mines, like a running issue, always liquid, proceeding from the metallic veins, "*vomica liquoris æterni*." They imagined it to be something quite different from the "*Hydrargyrum*" extracted from the Minium (Sulphuret of Mercury) by sublimation. This Minium,* the Vermilion used in painting, Theophrastus relates, was, eighty years before his time, discovered by Callias, an Athenian, who, from the brilliant red of the ore, imagined it contained gold, and making experiments upon it, failed in that expectation,

* *Miniaría* (fodina), the quicksilver-mine, is the source of the Italian "*miniera*," and of our "*mine*."

but obtained the pigment. This was in a silver-mine at Ephesus. But when Pliny wrote, Minium was brought to Rome only from Sisapon in Baetica (Almaden): the mine being the property of the State. The ore was not allowed to be prepared on the spot, but brought in sealed packages to Rome, where it was ground and washed; and the price fixed by law to 70 sesterces ($17\frac{1}{2}$ denarii) the pound weight. As much* as 2000 lbs. were annually exported from Spain. This kind was exclusively used as a pigment: an inferior sort, the Secundarium, found in the same mines, only assumed a vermilion colour after it had been roasted: this was used for adulterating the native Minium, and also for making Hydrargyrum (see GILDING). This was extracted in two ways; either by the *wet process*, by pounding the Minium in a bronze mortar with a pestle of the same metal; or by *sublimation*, being placed in an iron saucer (concha) inside an earthen pot, having a top carefully luted down: then a fire being made under the pot and blown with bellows, the Quicksilver sweated in drops through the pores of the earthen covering, and was wiped off and collected.

The Stimmi or Stibium met with in the silver-mines, "like a froth, and bright white," of two kinds, the male and female—the former rougher and lighter and more sandy in texture, the latter brighter and full of cracks—was our Sulphuret and Oxide of Antimony, which, on the same account, the Germans term Spiess-glass or Rod-glass.

* Pliny puts his readers upon their guard against an ingenious trick of the painters (in fresco) of his times. The Minium being provided by the employer, on account of its intrinsic value, the artist was perpetually washing his brushes, under pretence of cleaning them; and, at the end of his job, collected from the deposit in the water-pot a remunerative quantity of the heavy mineral. Vasari tells a similar story, how P. Perugino played the same game with the Ultramarine supplied by the suspicious Abbot.

It was in great use as a desiccative for ulcers, and also as a medicine for the eyes. This is the *Kohl*, still as necessary to an Oriental lady's toilette as in the days of Jezebel who "painted her eyes" (not "her face") when she essayed the power of her beauty upon her son's murderer. The powder is applied upon a little bodkin drawn through the closed eyelids, and besides strengthening the sight, augments the apparent size of the eyes themselves, that grand desideratum in the beau ideal of the East. On this account *καλλυβάριον* became the generic term for all cosmetics for the face.

The oxide skimmed off the silver in the melting-pot, known by the Greek name *Helcysma*, also entered into the ancient pharmacopœia as a caustic and desiccative.

The alloy in the Greek silver coinage generally appears to have been nothing more than the lead their refiners had not sufficient skill to get rid of: nevertheless the Athenian currency was distinguished above all the rest for its purity. Hence Xenophon's notice (*Vect. iii.*) as to the profit to be got upon the exportation of it to foreign countries: adding, what seems unaccountable, that the money of other States had no currency out of their own limits.* A lasting proof of the vast supply of silver flowing into the Athenian mint is the fact that it was issued principally in pieces of the largest denomination known in free Greece, the four-drachma piece. And this was so from the very beginning of the coinage, as is evinced by the extremely archaic type of most of these medals. The other States, both of Hellas and her wealthy colonies

* Hence the simile of the philosopher quoted by Diogenes Laertius, how the Attic pieces, ill struck, misshapen, were preferred, on account of their intrinsic goodness, to the elegant and round-coined mintage of Alexandria; alluding to the coinage of the Ptolemies, the best executed on the whole of any in the Greek series.

in Italy, very rarely exceeded the dimensions of the double-drachm. The silver of the Macedonian conquerors of Asia, the Selencidæ and the Ptolemies, is for the greatest proportion of it on the same enlarged scale as that of the Athenian: in fact, Alexander even went so far as to double its *module*, for a few eight-drachma pieces of his are extant. It must be borne in mind that the coins of the largest denominations are naturally the first to disappear upon any recoinage, and therefore leave the fewest representatives of their class behind them. Even these, for the age, monster medals, were in the next generation surpassed by the renowned 'Syracusan Medallion,' a coin ever regarded, both for its beauty as well as dimensions, as the greatest triumph of the Grecian mint. Its weight of 668 grains troy, shows it to have been issued as a ten-drachma piece: and at the same time the panoply, together with the explanatory legend AΘΑΑ, in the exergue, declares the object for issuing a coin of this large intrinsic value; as constituting the units of the money-prize proposed together with a suit of armour for the reward of the victor in the chariot race.

The four-drachma piece, as the most important, is distinguished by the Hellenistic writers by the title of *δρυόριον* specially. This is the meaning of the word whenever it is used by the Evangelists. A singular proof of this is deducible from the miracle of St. Peter's capture of the gurnet, which enabled him to pay the tribute for his Master and himself. This tax being half a shekel per head, it is a necessary consequence that the *δρυόριον* supplied by the piscine banker was a shekel in value, that is, a coin equivalent to four drachmas.

The Romans adopted a Silver currency at a somewhat late period of the Republic, not until 269 B.C. Their standard was as high as the Greek during the Republic

and throughout the reign of Augustus and his next successor. The *legal* weight (according to Pliny) of the denarius was 74 to the pound, or 69 grs. Roman, about 63 Troy each. But, notwithstanding the vast supplies flowing into the treasury from Spain, the standard of the silver coin rapidly fell.* Under Vespasian the alloy was one-eighth, under the Antonines one-fourth, under Severus about one-half; after which time there seems to have been no fixed standard, some denarii being worse, others apparently better than the last mentioned. The weight also diminished fast. Those of Augustus average 60 grs.; of Vespasian and his sons, 50; and this weight seems to have been the legal one down to Caracalla, who issued double denarii (on the model, apparently, of the older didrachms), weighing about 90 grs., his denarii being about 45. Gordian only coined the large, the "*pecunia majorina*" of the edict of Constantine, and even this module declines under Gallienus to 70 and 65, when the silver coinage ends, base though his be. For after Spain had been lost to the State, in consequence of the usurpation of the various pretenders to the Empire in the time of Gallienus, the silver currency altogether vanishes, and is replaced by *Billon*† denarii, in which the *silver* forms but one-fifth, or even less, of the weight of the coin. These pieces, extremely bright when fresh, in consequence of the silver being forced upon the surface by the pressure of the stamp, be-

* Antony, notices Pliny, alloyed his denarii with iron; to harden the coin, it would seem, for the lightness of the iron would leave little margin for profit upon the result. This strange tradition is quite true; the accurate Pinkerton states that he had seen a legionary denarius of the Triumvir fly to the magnet like a bit of steel.

† *Billon* signifies the mixture of either gold or silver with more than its own weight of alloy, so that the baser metal preponderates in the mass. Some derive it from the Spanish *vellon*, some from *bulle*, others from *vile*, all equally wide of the mark.

come quite coppery after a little circulation.* Pinkerton ascribes the evident scarcity of silver coin under the Empire, even in its most flourishing times, to the drain of specie towards India for the purchase of precious stones and silk, and compares it with the same beginning, to be sensibly felt in his own times (1784), occasioned by the purchase of tea. After an interval of fifty years Diocletian, having reunited the dispersed members of the Empire, re-established the silver currency upon its original footing as regards fineness; and this continued, though the weight of the denarii gradually lessened, until the fall of the Western Empire.

Diocletian's restored silver denarii are ninety-six to the Roman pound, hence many of them bear the numerals *xv* within a wreath on the reverse. They, being eight to the Roman ounce (of 433 grs. Troy), would equal 54 grs.

* Precisely the same effect and change are to be observed in the present billon coins of the Germans, their *zwanzigers*, *groschens*, and *hellers*. More lustrous than standard silver, when "fire-new," a few days' currency reduces them to their copper nakedness. Numismatists, unacquainted with metallurgy, go on talking of "bronze saussé" and of "copper washed with silver," a process of impracticable application to such a coinage as this. These billon pieces, base as they were, constituted the denarii of their times, and in fact were coined upon the precise type of the larger denarius introduced by Caracalla. To proclaim their current value to all disbelievers, the * "*nota denarii*" appears on the reverse of many in the series. They constitute the denomination in which the prices are calculated in the *Sextus Edict* of Diocletian, fixing the *maximum* throughout the Empire. It may be that the enormous debasement of their standard was adopted as a measure of policy, in order to prevent the exportation of the silver currency. After the re-establishment of a pure silver coin, the billon seems to have fallen below its intrinsic value, as was the case with that of our Henry VIII., inasmuch as, though of varying alloys, the whole, at the last, only went at the estimation of its lowest. For this reason Constantine, in a rescript to *Limenius*, threatens with capital punishment all refiners who should hereafter melt down (a common practice, he says) the "*pecunia majorina*," to separate the silver it contained.

Troy each. But his successors, though they did not again debase the standard, rapidly curtailed the weight, so that few of theirs exceed 30 grs. Again, double denarii were coined, of which one thousand were equivalent to a pound of gold: which gave them the name of *milliarenses*. The few denarii struck by Justinian and the Italian Goths seem intended for 20 grs. Roman, but only equal 15 Troy. These light denarii were the parents of the Anglo-Saxon silver penny (of the same weight), a coin that can now boast, through its English line, an unbroken succession of 1300 years.

It remains to me an inexplicable mystery why the Republic, whose sole circulating medium for fully 200 years was silver, should never have followed the example of the Sicilians with whom she was in so long and intimate an intercourse, and have perceived the convenience of having coins of a larger denomination than the single denarius. But so it was: even a double-denarius of the Republic remains yet to be discovered. The Byzantine emperors, virtually an Asiatic race, from the very beginning coined but little silver: after the 5th century their currency (with exceptions not worth noticing) consisted entirely of gold, issued largely also in small subdivisions, *trientes* or thirds of the aureus,* and of copper, beginning with enormous clumsy *folles* (of which 210 and after Justinian 180 went to the solidus); expedients intended to remedy the absence of the denarius and its half the victoriatu.

Forgery of the current coin seems to have been almost coæval with the very invention of striking money. Very shortly after that epoch, Herodotus makes Polycrates, the tyrant of Samos, buy off his Lacedæmonian invaders in lead pieces plated with gold struck for

* Or *solidus*, of 6 to the Roman ounce, or 72 grs. Troy each at first. It stood for many centuries at 60 grs. = 12 shillings.

that purpose. These counterfeits are composed with much ingenuity, a disk of lead, or more generally of copper (technically called a *blank*), was placed between two corresponding plates of either precious metal, then laid between the dies, when the blow of the hammer consolidated them into one inseparable body. This fraud would almost defy detection before the pieces were worn by use: to test the coin therefore became with the Romans a regular profession, and the citizens were so grateful to its institutor, Marius Gratidianus, that they erected a statue to him in every street of Rome. Pliny observes, "this is an art in which what is wrong alone is the thing to be learnt: a forged denarius is the model, and, a surprising anomaly, the students pay many good coins for a single bad one" (meaning probably for one of some new or more ingenious *fabrique* than usual). Trimalchio, with his proper absurdity, declares there are two professions he especially admires: that of the physician who can see what is going on in a man's inside, and that of the money-tester who can spy out the copper core through its gold envelope.

The chief luxury of the Romans as connected with this metal lay in the accumulation of plate chased and embossed by Grecian artists. These appear to have worked during the two centuries ending with Pompey's times, under whom flourished Teucer, the last of any note. Pliny has given a full list of these artists and their principal works.* They consisted either in complete vessels wrought out and embossed by the hammer in the *Repoussé* style, or in small separate chasings in solid metal, intended to be set in pieces of plate or similar articles: hence called *Emblemata*. After Teucer this style of work suddenly became extinct, its place as a branch of high art being,

* For the history of this remarkable art see *Calatura*.

there is good reason to suppose, taken by cameo-engraving, which now occupied the same class of artists, the *Oelatores*, and supplied the same uses, as the *emblemata* before. Thus it had come to pass that in Pliny's age the old chased plate was valued as a curiosity alone, and fetched the same extravagant prices, though the chasings had become entirely obliterated by time and wear. After this the luxurious vied with each other in the production of the largest dishes in silver—the weight alone being the object in view. This was the first form of extravagance in which the newly-acquired treasures of the Republic were expended, it coming into fashion to have dishes that should weigh one hundred pounds each; and of such, previous to the First Civil War in Sulla's time, there were known to have been a hundred and fifty or more in existence at Rome, possessions to which many a wealthy epicure owed his proscription. But these were far exceeded in magnitude by others produced by the ostentation of the imperial freedmen. Pliny quotes the instance of *Drusillanus*, a slave of *Claudius*, and the treasurer of *Hither Spain* (the province containing the mines), who had a dish made in a forge built for the purpose, weighing 500 lbs., with eight plates to match it, weighing together 250 lbs. Whereupon Pliny sarcastically asks how many of his fellow-slaves it took to carry in this dinner-service, or who were the guests it was set before?

Silver at the same time came into general use for the decoration of the patrician's atrium in the form of ancestral portraits, which were either busts in relief on circular plaques (*clipei*), or else full-length statues. These superseded the ancient wax-portraits actually modelled upon the face of the originals after death, and preserving thus for many generations authentic likenesses of the great departed: a change of fashion against which Pliny bitterly

inveighs, both on account of the want of resemblance in these metal reliefs (*surdo figurarum discrimine*) and of their liability to destruction in consequence of their large intrinsic value. It was the usual belief that the first statues in silver had been made in honour of Augustus upon his deification; but Pliny mentions such of Pharnaces, first king of Pontus, and of Mithridates, as being exhibited in Pompey's triumphal procession. The most colossal work in the metal on record is the column of Theodosius, weighing 7400 pounds, which stood in front of Santa Sophia, until melted down by Justinian to make way for a bronze equestrian statue of himself. Theodosius had a precedent for his extravagance in the "palmated column," supporting a statue likewise in silver, of the total weight of 1500 pounds, erected by the Senate to Claudius Gothicus.

Besides these gigantic exhibitions of luxury, silver was, under the Cæsars, employed for other articles of convenience, and upon a scale never afterwards emulated. Pliny talks of the ladies of his time disdaining bathing-tubs unless made of this precious material. And a few years later Statius, describing the magnificent baths newly erected by a private man, Claudius Etruscus, boasts that no bronze appeared in them:—

" Nil ibi plebetum, nusquam Tamesen notabis
Æra, sed argento felix propellitur unda
Argentoque cedit, labrisque nitentibus instat
Delicias mirata suas, et ebire recusat."

The best mirrors of old had been the manufacture of Tarentum, made of tin with a mixture of copper: but under Pompey, Pasiteles the chaser had cast them in fine silver, which, by Pliny's time, had got down even into the hands of the servant-girls. He notes as a recent discovery that, if gilt on the back, they reflected objects more truly.

And this remark of his has suggested to me the suspicion that the gold rings with broad highly polished oval faces, never engraved, so frequently met with in Campanian tombs, were intended for finger-mirrors, like those of the Hindoo women at present, although the latter now are set with a bit of looking-glass.

The Egyptians at some unknown time invented the art of *Niellatura*, in long-after ages carried to such astonishing perfection by the Florentines of the Quattro-cento school. This may be deduced from Pliny's somewhat obscure statement (xxxiii. 46): "Egypt stains silver in order to see her darling Anubis upon the plate; and *paints* the metal instead of chasing it." The pigment was made by adding one-third by weight of the finest copper, and as much of sulphur, to some silver (in filings probably): this mixture was roasted in a pot with a luted cover until the cover opened of itself. It seems to have preceded, and been a substitute for, enamel, afterwards applied to the metal in the way described below.

The Niello * of the Florentine goldsmiths, so justly celebrated, was a somewhat similar composition; Cellini's recipe for it being to take one part silver, two copper, three lead, melt them together, and pour into an earthen pot half full of sulphur: the mass to be ground up when cool, and used like enamel. To apply it the design was first engraved in line upon a polished silver plate, precisely after the manner of a copper-plate (which style of engraving originated in this); the powdered niello was then laid on the face and fused upon it by the application of heat. The superfluous mass being removed by polishing, the lines in the silver came out filled with a dark violet: the μέλαν of the Byzantines, the *nigellum* of the later Latins

* From "Nigellam," the Low Latin equivalent of the technical Byzantine name μέλαν.

—whence the name given to the art. The delicacy of the best class of works in this style is beyond conception. They have also the weighty recommendation of imperishability; counteracted, alas! in too many cases by the intrinsic value of the basis.

This art was applied by the Asiatic metallurgists to the decoration of armour as early as Homer's days, for he describes (Il. xi. 25) Agamemnon's breastplate as inlaid with outlines, οἶμοι, *ten μέλανος καίνοιο*, "of dark azure," twelve of gold, and twenty of tin. In the former material were three dragons on each side, stretching themselves up towards his neck. This was a present from Cinyras, King of Cyprus, an island either belonging then to Egypt, or in very intimate relations with that kingdom. The silver band of his shield was adorned with a triple-headed dragon in the same composition. In Pliny's times (l. c.), and apparently earlier, it was applied to triumphal statues,* for (54) he refutes the popular notion that statues in silver were unknown before the Augustan age, quoting those of Pharnaces and Mithridates, already mentioned.

Small works of the Lower Empire often occur ornamented with devices in a true niello, fused into an engraved outline; and even some copper plaques have come to my knowledge with figures done in this composition; but we have no remains of any artistic value in this style before it was taken up by the Florentine artist-goldsmiths. The Byzantines applied niello to the decoration of jewels in gold, in cases where it was not convenient to introduce the *cloisonné* enamels they loved so much as embellishments to that precious metal; and of this class also examples are yet extant.

But the latter mode of ornamentation had been long before

* In decoration of their armour, it must be supposed, as upon Agamemnon's.

in use, for Heliodorus, writing in the fourth century (*Æth.* iii. 4), describes the zone worn by his heroine Chariclea as "a work in which the artificer had locked up the whole of his skill, having never before wrought such a piece, neither being able to do so a second time. It was made like two serpents, their tails tied together behind the wearer's back in a knot, whilst their necks, passing underneath her breasts, were entwined in a tortuous noose; their heads, allowed to pass through this tie, hanging downwards on either side as an addition to the fastening; you would have said that the serpents did not seem, but actually did crawl: yet they were not terrific with a menacing and cruel aspect, but relaxed by a gentle torpor, as though lulled to sleep by love upon the maiden's bosom. Their material was gold, but their colour violet; for the metal was darkened by art, in order that the deep tinge united to the gold might set off the asperity and the alternation of their scales."

As before observed, this was pre-eminently the art of the Italians of the fifteenth century, or, in other words, before it was driven out of the field by the revival of gem-engraving, precisely as the Greek silver-chasing had been superseded by the Camei fourteen centuries before. Maso Finiguerra, who flourished at Florence circa 1460, has always been regarded as the first in this department. Vasari also bestows the highest praise on the nielli of Francesco Francia (b. 1450), "who often on a plate only two fingers high by a little longer put in twenty figures equally well drawn and beautifully finished." These, with his equally-famed enamels and pieces of plate executed for his patrons the Bentivogli, tyrants of Bologna, were lost or destroyed upon the expulsion of that family. Cellini mentions that when first commencing business, hearing old people talk of the wonderful performances of Finiguerra in this line,

he was seized with a desire to emulate him, in which he perfectly succeeded. As we have only his own word for it—and his judgment upon his own merits is far from impartial—the fact of his eminence in niellatura may well be doubted. We have, indeed, abundance of small silver trinkets of his age, rings, buckles, &c., but they cannot claim to be considered works of art, but only trade-articles of a manufacture. The art yet lingers in its lowest form in Petersburg, confined to the production of rude decorations upon the lids of snuff-boxes. There is a little relic in niello preserved in the Waterton Dactyliothecca, which yields to few in historical and in romantic interest. It is the wedding-ring of Cola di Rienzi, “last of Romans,” bearing in the shield his well-known device the star, repeated with a bar between, surrounded by the names NICOLA and CATARINA (dei Rasselli) his wife, the letters relieved in the silver with a ground of niellatura.



CÆLATURA: τορευτική: Chasings: Antique Plate.

ALL decorative metal-work was originally executed with the hammer alone: hence its designation σφυρήλατον. So made were the first statues seen in Greece, ascribed to the mythical Dædalus, or to his pupil Learchus; the several parts being hammered out separately and then put together by means of rivets, the expedient of soldering not being as yet invented. Some of these archetypes were seen by Pausanias, still remaining in the second century of our era, for instance, the Jupiter of Sparta, "the most ancient statue in Greece." ('Laconica,' iii. 17.)

Long after the method of casting statues in moulds with cores had superseded this primitive and tedious process, the hammer continued the sole instrument for producing works in the precious metals, whether statuettes or bas-reliefs. Everything belonging to the Assyrian, the Etruscan, and the Greek goldsmith (as long as the period of fine art lasted) is wrought by the hammer and the punch. The substance is the thinnest possible plate of the metal; the small intrinsic value of the object, with the infinite taste and toil bestowed upon its elaboration, convincingly bespeak the times when gold and silver were extremely rare, but skilled labour very abundant. Nothing known to me so strikingly exhibits the marvellous might of Greek genius, even when exerted in miniature, as do some remains of this kind, foremost amongst which stands an Apollo's head (Bale Collection), in three-quarters relief, whose divine

perfection amply explains and almost justifies the Roman mania for toreutic masterpieces. This kind of work, aptly termed by the French *Repoussé*, was done thus: the plate being laid upon a yielding substratum (a kind of soft cement made of pitch and brick-dust) was beaten with blunt punches of various forms into a connected series of hollows roughly making out the intended figure. When the metal was taken up these indentations formed a rude relief on its other side, out of which dextrous manipulation, aided by the finishing touches of the graver, produced a delicate result, and that speedily, under the hand of a master in the craft. Figures in full relief like the graceful vases, or the exquisite tiny Cupids, so frequently dependent from the Grecian ear-rings, were beaten out in two halves and then soldered together; melted mastic being lastly run into the interior of these fragile creations to strengthen them against pressure. This art also was revived and restored to its pristine glory by the Italians of the sixteenth century; they even went beyond the ancients and applied it to steel in the shape of casques and bucklers of parade, of which examples of almost incredible excellence are to be seen at Florence, in the Galleria; at Paris, notably the helmet of François I.; and in our Tower Armoury, made for one of the Gonzagas. The mode of thus working in gold is minutely laid down by Cellini in his '*Orifeceria*'; his early reputation was acquired by his medallions executed in this manner. His Atlas in full relief, bearing up the world in crystal, a commission from his early patron Fran. Ginori, having been afterwards presented to François I. by the scholar L. Alamanni, was the first cause for that tasteful monarch's summoning Cellini to his court.

The art survived down to the middle of the last century, being extensively applied to the embossed watch-cases greatly in fashion during the four preceding reigns, many

of which are, indeed, perfect toreutic masterpieces. Afterwards, as an old Roman goldsmith informed me (who could remember the last days of the business) an expeditious substitute was devised by taking from the model a hollow matrix in "fusible-metal," into which the soft plate of gold was beaten with a leaden punch, and then finished off with the graver.

The Greeks called the art of working in relief, in whatever metal, *τορευτική*, and ascribed the invention to Phidias. Of this style in bronze the British Museum possesses the two finest specimens extant; the "Bronzes of Siris," forming the shoulder-plates of a cuirass (supposed that of Pyrrhus), embossed with Heroes combating Amazons, and the yet more admirable mirror-case, or discus, with the "Marriage of Anchises and Venus," in the highest possible relief. The particular branch, however, practising in silver, only came into high repute under the rich and luxurious successors of Alexander.* The toreutic artists went by the name of "Crustarii," amongst the Romans, from their small reliefs being termed "crustæ," because used for incrustation of vessels. "Emblemata," however, was the more usual term for their productions, from the mode of their application to the surfaces decorated, being "let into" moulded frames soldered upon the exterior of the plate, so that the emblema, merely secured by claws, could be removed at pleasure; a mode of spolia-

* This application of the art to convivial purposes was the true cause of the decline and complete extinction of the manufacture of painted vases, before this, articles of refined luxury and giving employment to the best painters of the times; in fact holding the same place amongst the early Greeks as the Sèvres porcelain amongst ourselves. No painted vases, even in Campania, were produced after the date B.C. 200. Persius has noticed this revolution in taste, and its cause,—

"Aurum vasa Numæ Saturniaque inpulit æra
Vestalesque urnas et Tuscum fictile mutat."

tion in which that very unscrupulous amateur, Verres, is accused of having particularly delighted.

The head of the profession was Mentor: as a proof of the reputation of his works, Pliny states that Crassus the Orator (not the millionaire), paid one hundred sester tia (1000*l.*), for a pair of bowls by him; a piece of extravagance, however, of which he declared himself too much ashamed ever to have made use of them.* Mentor's four pair of vases (his masterpieces the words would imply) had perished long before Pliny's age in the conflagration of the Temple of Ephesus, and in that of the Capitol. Next to him in celebrity came Acragas, Boethus, and Mys, all three natives of Rhodes. Their best pieces were then yet preserved in three of the temples in that island: they were bowls (scyphi), with chasings of Centaurs and Bacchanals. Of Mys the most admired work was his group of Sileni and Cupias; of Acragas, a hunting-scene. After them came Calamis; Antipater, "who seems to have really planted his drowsy satyr upon the vase, rather than to have chased his figure there;" Stratonicus of Cyzicas; Tauriscus; and several more of unrecorded fame. In the last days of the profession, under Pompey, flourished Pasiteles; Hedystratides, renowned for his battle-pieces; Zopyrus, for his Areopagites and Trial of Orestes upon a pair of scyphi valued at the enormous sum of 1200*l.* (H. S. xii. | Jan's reading), and lastly, Pytheas, who closes the list with a single emblemata, weighing no more than two ounces, the Rape of the Palladium, which fetched 10,000 denarii (400*l.*). The same artist was noted also for very small cups embossed with kitchen-scenes (ma-

* The same amateur also possessed plate that had cost him 6000 nummi (60*l.*) per pound Roman (about 10*½* oz. Troy). It is amusing to find these connoisseurs of old never able to separate the ideas of the intrinsic and the artistic value of the silver.

giriscia),* wrought so wondrously delicate that it was impossible to take casts from them for fear of bruising the relief.

After this, adds Pliny, the art died out all at once, so that the old work came to be sought after for its antiquity alone, even though its subjects were completely defaced by wear. For this its sudden extinction when at the height of its glory he assigns the reason (49), "At present chiselled work (anaglypta) is all the rage, in which the silver is cut away around the outlines of the design." (Nunc anaglypta asperitatemque, exciso circa linearum picturas quærimus.)† In fact it was executed precisely in the manner of a cameo in sardonyx, a species of decoration for plate then rapidly coming into vogue. It must, however, be confessed, that for practical use, this carved ornamentation in flat relief was justly preferable to the more effective but fragile repoussé-work, so liable to be crushed, so easy to be detached from the vase. The latter point Cicero strikingly illustrates by drawing a ludicrous picture of Verres, at a dinner given him by a Sicilian nobleman, Eupolemus, appropriating, before the eyes of the astounded host and company, the emblemata from the sole pair of vases thus enriched that were exposed to his observation: and again how he served Pompeius Philo

* Bernard Palissy was not original in his idea of embellishing vessels for the table with the figures of disgusting reptiles: these old Greek chasers had anticipated him in the whim—

"Inserta phiale Mentoræ manu ducta

Laocerta vivit et timetur argentum."—*Mart.* III. 41.

The poisonous creature showed in relief at the bottom of the deep bowl, and took the drinker by surprise as he drained its contents.

† The same fashion descended to the earthenware on the tables of the commonalty; this so-called "Samian" embossed (primarily an Aretine manufacture but later prodigiously multiplied in Spain, and in Gaul for export to this country) preserves to us, in style, execution, and designs, exact though ruder, representations of the contemporary anaglypta of the wealthy.

the same trick with the only *patella* he, although believing himself secure in his quality of "Civis Romanus," had ventured to produce (Verrin. iv. 22). Pliny notes that Zenodorus (Nero's daring Colossus-maker) had copied a pair of vases made by the ancient master Calamis, so exactly that the difference between them was hardly to be detected: a convincing proof that the old repoussé work had gone out of use, not from the want of artistic ability to execute it, but solely in consequence of its unsuitableness to the service of the table.

The Roman old-plate collectors were a class identical with our own old-china collectors, respectable, wealthy, elderly gentlemen, who unmercifully bored their guests with the pedigree of all the pieces adorning their side-boards. Martial has an amusing epigram (viii. 6) upon some old Mr. Euctus, who after prosing upon the history of his several bowls, chalices, and flagons, treats his friends "in Priam's cups to Astyanax wine:" i. e. wine as young as the vessels were ancient. The most extraordinary use to which silver plate was ever put was that devised by Julius Cæsar when ædile at the games given by him in honour of his deceased father. Not merely was all the furnishing of the arena formed out of silver; but the only weapons allowed to the combatants (condemned criminals) wherewith to encounter the wild beasts engaging them were silver vessels: "*Feras argenteis vasis incessivere noxii.*" Though Pliny does not add the fact, it may be concluded that these precious missiles, were, the combat done, left for the spectators to scramble for. After such battering as the vases must have sustained from the poor wretches whose sole chance of life lay in the vigorous discharge of them against their sylvan foes, little value would have been left to the pieces of plate beyond their intrinsic. Cæsar evidently borrowed the notion from the oft-seen festal fight

between the Centaurs and Lapithæ, where the vessels snatched from the table supplied the combatants with weapons. This preposterous piece of barbarity came into such favour as to be adopted even in country towns. Well does Pliny exclaim hereupon, "Our age has done things that posterity will deem mere fables."

Heliogabalus was the first to make his entire "batterie de cuisine" out of silver: some of the pieces, adds Lampridius, weighed one hundred pounds each, and were chased with the most lascivious designs. His cousin and successor, on the other hand, reduced the whole service of plate used in the palace to the very moderate limits of two hundred pounds; and this too, notes the historian, entirely plain: gold plate was totally excluded from his table.* The Romans carried their services of plate about with them in their remotest expeditions. "To my own knowledge," says Pliny, "Pompeius Paulinus, though no more than the son of a Roman knight of Arles (and afterwards disinherited), had with him 12,000 pounds weight of plate when serving in the army campaigning against the most savage of all races." Meaning the army of the Rhine, in which the historian himself had held a command in the cavalry.

Rare, indeed, were the specimens of these torrentic wonders of the Greek school, that had escaped time and the melting-pot, until a fortunate discovery in 1830 enriched

* I cannot resist adding the same Emperor's regulation of the equipment furnished by the state to the civil governor (præses) of a province. It consisted of twenty pounds weight of silver plate, six she-mules, two he-mules, two horses, two suits of clothes for public wear, two for indoor, one bathing-dress, one hundred gold pieces, one cook, one muleteer, and, if they were not married, one concubine each, "because they could not do without them." On giving up office they were bound to return the she-mules, he-mules, horses, muleteers, and cooks, but the other articles (the concubine included) they might keep for their own in case they had behaved well; but if the contrary, they were forced to refund them all fourfold.

the Paris Bibliothèque with some of its choicest productions. A Norman peasant, one Tronchin, in ploughing his field at Bernay, struck upon a large tile, covering a hoard of silver articles, weighing altogether 60 pounds Troy (25 kilo.). It was the treasure of Mercurius Cannetonensis, the local divinity, as the dedicatory inscriptions upon several of the pieces attest, hastily buried in some time of trouble and never reclaimed. Of the vases, a pair of canthari have emblemata in the purest Greek style, as early as Alexander's epoch, representing subjects connected with the Mysteries.* Two pairs more, of the same period, bear Bacchic scenes and symbols; some other minor pieces are similarly decorated; but the most important are the two "cenochœ," tall flagons ("Cellini-shape" in modern phrase) embossed with scenes from the Iliad, the design of which refers them to the epoch of Pasiteles. The episodes chosen by the artist are Achilles weeping over the slain Patroclus; its counterpart being the Ransoming of the body of Hector: the other, Achilles dragging Hector behind his car, with its companion scene, the Death of the hero. With the vessels were found two spirited statuettes of the god to whom they were dedicated, in the same metal, and executed by the same process; one of them being the most important example preserved of statuary in silver. The pieces of Roman workmanship declare the more practical character of their epoch: consisting mostly of large flat dishes having for sole ornament a chasing in the centre. But this chasing is solid and strong, being first cast and

* On each vase are two groups, one forming the pendant to the other; an aged female seated and a man standing in conversation with her, or vice versâ: between the pair is a monumental cippus supporting a lyre and a mask. The latter group must have an important meaning and one popular at the time, for the same often occurs on gems, notably on the fine Marlborough Sard No. 393, where, for want of better, it is explained as "Sappho and Phaon:" more probably, a comic poet and Thalia.

then tooled up according to the modern practice.* Of these offerings the Iliac vases were the gift of Domitius Tutus, together with several of the plainer dishes. The later pieces bear truly Celtic names as their donors—Camulognata, Coigi filia—Maxuminus, Caratini filius—Combaromarus, Buolmui fil—Emticeus—Germanissa Viscari.

Of the enormous patinæ recorded by Pliny, so difficult to conceal, so tempting to the spoiler, only a few representatives survive, and those on a comparatively insignificant scale. At their head stands the circular dish of the Cabinet of France, long known as the 'Shield of Scipio,' and, according to tradition, dredged up out of the Rhone by some fishermen in the year 1656. It is 28 inches, or three Roman feet in diameter, and weighs 25 pounds Troy (10 kilo.) The bas-reliefs covering it, the "Restoration of Briseis," being at first understood as the story of Scipio and the bride of Alluvius, gave its popular name. The style of art indicates the third century for its date,† Equally late are the discs of Madrid, and that of Geneva, both with historical subjects; the design on the latter commemorating the marriage of

* The chasings are fully described by Chabouillet, 'Trésor de Bernay,' in his admirable "Catalogue des Camées de la Bib. Imp."

† The tale of Troy supplied the staple for the decorations of plate, down to the latest times of the Empire. A very remarkable exemplification of this, is the Stroganow discus, 10½ inches over, filled with a relief, cast, of the dispute between Ajax and Ulysses, before Minerva, for the arms of Achilles displayed in the exergue, amongst which the Roman *calique* replace the Homeric greaves. With this discus was found another, 16½ inches over, chased with a horse feeding under a tree, in a better style, within a border of fern-leaves, elucidating the "filiati" of Trebellius quoted further on. In the same hoard were two vessels, one elegantly gadrooned, of true Sassanian work, and latest of all a dish with a Oufic inscription. The whole had made the spoils of some Mongol chief, after a successful foray in Persia, for they were found in the bank of the river Kama, province of Perm in the year 1780. (Figured by Köhler, 'Kl. Schrift.')

Valentinian II. The Emperor appears holding the orb and the labarum and crowned by Victory, and surrounded by his officers, with the inscription LARGITAS VALENTINIANI AVGVSTI. This piece is small, being but 12 inches in diameter, and weighing $34\frac{1}{4}$ ounces.

Another discus (Naples) though the smallest of the series, being no more than seven inches in diameter, yet far exceeds the rest both in beauty of design and historical interest. The subject is the Death of Cleopatra. The last queen of Egypt appears sinking backwards lifeless from her chair into the arms of Charmion, who is enveloped from head to foot in an ample robe of mourning; Iras, her other maid, stands opposite wringing her hands in despair. The Genius of Death, depicted in the guise of a Cupid with long dusky wings, his legs crossed, his drooping head supported upon his hand, leans against Cleopatra's knee, and by this charming allegory unmistakably points out the meaning of the composition. A statue of Venus Victrix stands upon a cippus in front, below which is an altar kindled. Underneath the queen's seat is discovered the overturned basket of fruit, inside which the asp had been smuggled into her place of confinement. I know nothing in ancient art more effective, or better expressive of its story than the design of this group. It was found at Civita in 1768.

But by far the most interesting of these wrecks of imperial splendour, both as regards the nature of the relief upon it and the circumstances of its exhumation, is the "Corbridge Lanx" (preserved at Alnwick Castle), so called from the place where it was discovered. It had been buried together with an altar dedicated to Hercules by an inscription in Greek hexameters, the sole example extant of the use of that language in Britain. This differs in shape from all the foregoing, being an oblong measuring

19½ × 15 inches, and weighing in its present state 159 ounces.* The subject is the Pythia Herophile, enthroned upon the *omphalos*, receiving the dictates of the Delphic god, and attended by Themis, Pallas, and Diana, the last goddess standing under the sacred chesnut-tree (*fagus*). The exergue is occupied by their respective attributes,—the hound, stag, blazing altar, and gryphon; and the whole composition is inclosed within an elegant floriated border. The spiral columns introduced into the architectural part, prove the age of its workmanship not prior to the times of Severus.

Pliny remarks it as a strange anomaly that although so large a number of artists had gained celebrity by their chasings in silver, there was not one on record famed for similar work in gold. The reason may be the very simple one that at the time when these great artists flourished gold was as yet too scarce to be thus employed. But of gold-plate chased in that later style noticed above as coming into vogue in Pliny's own days, a vast, to us incredible profusion, as will be described hereafter, graced the sideboards of the Romans under the Empire. A faint idea may be formed of its costliness from the sole remnant left, the "Patère de Rennes" now enriching the Bibliothèque Impériale. In form it is a shallow bowl, ten inches in diameter, and weighing about 40 ounces Troy. In the centre is an emblemata, a spirited composition, the renowned Drinking-match between Hercules and Bacchus; containing eight figures—the two gods,

* The original weight was considerably greater, for it rested upon a shallow foot or basement, which was torn off and melted by the finder. It is marked, according to the Roman (and present) custom, on the bottom with the weight in dotted numerals, but their system here, as in other cases, has not yet been made out. I give them, therefore, as a problem for archæologists.

the attendant Fauns and a panther. It is surrounded by a frieze exhibiting in low relief the triumph of the jolly god over his competitor; into which enter twenty-nine figures and five animals—elephants, panthers, goats. The broad exterior rim is adorned with equidistant garlands, of acanthus and laurel alternately, in which are set eighteen aurei ranging from Hadrian down to Geta inclusive; that is, of all the princes of the surname Antonini. This precious relic was found at Rennes (1777) in clearing away the foundation of an old house. It had been deposited in a vault together with a hoard of coins dating from Nero downwards; and what is of special interest as marking the date and perhaps the occasion of its concealment, a necklace made out of aurei of the usurper Postumus set in frames of pierced work.*

In this instance, the insertion of coins as ready-made embellishments, to supply the place of chasings from the hand of the actual modeller of the piece, betrays the influence of the decrepitude that was fast creeping over the arts in the age of Severus. In the works of a better period the very accessories boasted a fertility of invention coupled with a minuteness of execution, rivalling the masterpieces of Cellini's school. Trebellius Pollio has a passage well worth extracting in proof of this:—"We saw not long since, Corn. Macrianus belonging to the same family [as Quintus one of the Thirty Tyrants] at a feast given by him in the Temple of Hercules, having a patera of electrum which displayed in its centre the head of Alexander the Great, and in the circumference his complete history; the drawing of the figures being compressed and extremely minute. Out of this vessel he

* The "*opus interrasile*," noticed by Pliny as a new invention then, "in which the value of the piece is augmented by what the file has wasted of it."

drank to the health of the chief priest, and then ordered the same to be carried round the company for the gratification of all the admirers of the great hero."

The foregoing remarks upon the extreme rarity of *antique* cælaturæ will surprise many archæologists who behold, nothing doubting, the numerous silver vases, all supposed found at Pompeii or Camæ, that have within the past twenty years enriched so many cabinets both national and private. The phenomenon may be accounted for by the fact of the existence of a regular manufactory for such relics at Castellamare, whence a continuous supply pours into the Paris and London markets through various artfully disguised channels. The imitation of the antique in these forgeries is wonderfully correct, and for further warranty they are coated with a thickness of oxide that it would defy Old Time, backed by his twenty centuries, to rival.

A specimen of early Roman *cælatura* in the first style, of extreme value in consequence of its date being exactly ascertained, is afforded by the "Sword of Tiberius." This relic of the German campaigns of his nephew is the short, broad, heavy blade of the national *gladius* (the hilt unfortunately wanting), encased in its sheath. The upper part of the latter is covered with a plaque in gilt bronze, representing in repoussé work in low relief the emperor seated; almost a fac-simile of his figure in the "Agate of the Ste. Chapelle," his hand resting on a shield, inscribed FELICITAS TIBERI, and attended by Victory erect, and also holding a shield with VIC. AVG. The casing of the point of the sheath also has a relievo, in a very grand style, of an Amazon standing brandishing her proper weapon, the *bipennis*. This last figure unmistakably personifies Rætia, lately subdued by Tiberius,—Horace, in his Ode on that occasion, having an allusion to the *Amazonia securis*, as the

national arm of that country. The reliefs, coupled with the legends on the shields, tell the story of the piece. It was a sword of honour, *parazonium*,* presented by the *Imperator* to some soldier of distinguished merit. It was discovered a few years back near Mayence, having doubtless been lost in some one of the innumerable fights between the invaders and the Germans that took place in the vicinity about the same period. Farrer, that enthusiastic collector, bought it of the finder at the incredible price of 800*l.*, and upon the dispersal of his collection (June, 1866) it was secured by Mr. Slade for the reasonable equivalent of 121 guineas. He, with princely generosity, immediately enriched our National Collection with this invaluable addition to its historical treasures.†

Treb. Pollio has preserved a most interesting list of a service of plate, thought a fit present from an emperor, Gallienus, to an officer of the highest grade, Claudius, Governor of Illyricum; given with other things, including a complete wardrobe of clothes, with the view of retaining him in his allegiance. The emperor had been alarmed by secret information that his powerful subordinate was disgusted with his weak and luxurious government. "*Misi autem ad eum pateras gemmatas trilibres duas, scyphos aureos gemmatos trilibres duos, discum corymbiatum argenteum librarum viginti, lancem argenteam panpinatam librarum triginta, pateram argenteam hederaceam librarum viginti et trium, boletar habieuticum argenteum librarum viginti, urceos duos auro inclusos argenteos librarum sex, et in vasis minoribus argenti libras viginti*

* As Martial aptly informs us (xiv. 32):—

"*Militis decus hoc gratique erit omen honoris,
Arma tritumicum cin gere digna latet.*"

† It was exhibited at a meeting of the Society of Antiquaries, June 21st, 1866, when Mr. Franks kindly gave me the opportunity of minutely examining the chasings upon the sheath.

quinque,* *calices Ægyptios operisque diversi decem*" (Claudius, 17). In this list the first two items are in gold, set with gems: the round *discus*, chased with ivy-berries, is of 20 lbs.; the oblong *lanx* with vine-leaves, of 30 lbs.; the flat *patera* with ivy-leaves, of 23 lbs.; the "mushroom-dish," of 26 lbs., has a chasing of a fishing-scene, the two flagons of 6 lbs. each, are embellished with emblemata in gold: the "chrysendeta" of earlier times.

The regular allowance of plate to a tribune we find detailed in a letter of Valerian's, containing a most curious specification of all such perquisites, written upon his raising the same Claudius to that rank: "*Argenti in opere annua pondo quinquaginta* (meaning silver plate, not coin) *Philippeos nostri vultus annuos cl. et in strenis lvil, et triesles clx., item in canco et scypho, et zuma, pondo xl.*" This latter item refers to the *gold* plate, following immediately as it does upon the mention of *gold* coin.

In Roman polite society a gold *phiale* was considered the authorized form for a testimonial, just as a gold snuff-box was, till lately, with ourselves. Martial thus elegantly repays the donor of such a substantial mark of admiration (viii. 51.):—

"Whose work adorns the bowl? Hath Myron's mind
Or skilful Mys the chasing rare designed?
Hath Mentor's hand its precious mould embossed,
Or far-famed Polyetele enhanced the cost?
No drossy clouds to dull its polish rise;
The testing fire its standard pure defies.
The yellowest amber with less radiance flames,
The swelling stamp the whitest ivory shames.
Art with material vies: so Luna rounds
Her orb when she with fullest torch abounds.
Dressed in Æolian fleece of silky gold,
So stands the goat as he in days of old,
Saviour of Phryxus: yet sure Helle fair
Had chosen this her lovely weight to bear.

* The term denotes the precious ornamental *glass-ware* of Alexandria.

Cyniphsian shears had spared these locks that shine,
 And Bacchus made him welcome to his vine.
 Bestrides his back Love graced with golden wings,
 Pressed by whose lip the flute of Pallas rings.
 So joyed the dolphin, 'neath Arion's weight,
 To bear through billows hushed his vocal freight,
 Hansel the glorious cup with worthy wine,
 No common menial's hand, but Cestus! thine—
 Flower of the feast—to pour the Setine fly!
 The god 's athirst, the very goat seems dry.
 Instantius Rufus! let me drink thy name,
 'Twas from thy hand this noble present came.
 If Telephus keeps her promise plight,
 And comes with love to crown the festal night,
 Thy first name shall prescribe my quaffing's length,
 And for the amorous war preserve my strength;
 Her coming doubtful: then to pass the time,
 Thy second seven times to each draught shall chime;
 But if she fails me, then dull care to kill,
 To every letter I a bowl will fill."

The tasteful luxury of the Greeks, when enriched with the spoils of Asia, appears to have revelled in the accumulation of drinking-vases, doubtless, like their prototypes in clay, of the most elegant and varied forms: for we read not of any display at their banquets of the giant, weighty, dishes, in the mere intrinsic value whereof the Romans who followed them (those John Bulls of the ancient world) loved to exhibit their extravagance. A remarkable instance is mentioned by Varro of the amount of gold plate in this particular form possessed by an individual. A certain Ptolemæus, a private man, gave a dinner to Pompey, during his campaign in Judæa, at which one thousand guests were entertained. Each guest had a gold cup to himself, and these again were changed for others at every course.

Athenæus (v. 30) extracts from Callixenus the Rhodian's 'Description of Alexandria,' a very interesting list of the gold plate possessed by a king who, from the circumstances

of his position and inheritance, must have been the most opulent of all the kings of Grecian descent, namely, Ptolemy Philadelphus. Callixenus speaks as an eye-witness of the display, which formed one of the features in the grand Dionysiac procession exhibited by that monarch. "Next in order to these came those who carried the gold plate; consisting of four tall vases of the Laconian pattern, ornamented with wreaths of vine-leaves. Then came some others holding four metretæ each [the metretes being above eight gallons]: then two more of the Corinthian fashion; the latter had figures chased in full relief placed above them upon their brims, and other figures in bas-relief, very elaborately worked, upon their necks and bellies; each of them contained eight metretæ, and they were carried upon stands.

"Next, a vat, in which were ten basins; next, two layers, each holding five metretæ, two *cothons* of two metretæ each; then twenty-two coolers, of which the largest held thirty metretæ, and the smallest, one. Next in the procession were borne four gold tripods of great size, and a beaufet for gold-plate, likewise of gold, set with precious stones, ten cubits in height, and having six stages, upon which stood figures four palms long, very elaborately wrought, to a very large number. Then two beaufets for cups (*κυλικεῖα*), and two more of glass banded with gold. Then two stands for vases in gold four cubits high, and three others of smaller size; ten buckets, an altar three cubits high, chargers twenty-five. After these marched one thousand six hundred boys, clad in white tunics, crowned part with ivy, part with pine-branches: of whom one hundred and fifty carried golden pitchers, four hundred bore the same made of silver, three hundred more carried coolers, twenty of gold, the rest of silver. After these came other boys carrying the vessels to contain the grape-

juice; of which twenty were of gold, fifty of silver, and three hundred of earthenware, the last painted over with all sorts of colours. And when these pitchers and pots had been filled, they contained sufficient conveniently to furnish drink for all the assemblage in the Stadium.*

But the best picture of Grecian magnificence in this line is set before us in the following extract from a contemporary writer, describing the banquet of a wealthy Macedonian noble (Ath iv. 2):

THE WEDDING OF CARANUS.

(From a Letter of Hippolochus in Macedonia to Lynceus at Athens).

When Caranus kept his wedding-feast in Macedonia, the guests invited were twenty in number. Immediately upon their taking their places at table, silver bowls were given to them as presents, one to each. Moreover, each before entering the banqueting-room had been crowned with a golden bandeau, worth five staters (guineas) apiece. And after they had drank off their bowls there was set before every man, upon a bronze dish of the Corinthian composition, a cake of the same extent as the dish itself, piled with chicken, ducks, wood-pigeons, a goose, and other such things in abundance: the guest receiving dish and all, handed them over to his attendants standing behind him. But for eating, a great variety of dishes were handed round. After this came a second oblong dish, of silver, upon which was a great cake covered with geese, and hares, and kids,

* The incredible amount of plate amassed by Alexander's successors can be estimated from one single fact. L. Scipio, after his defeat of Antiochus, brought into Rome 1400 pounds' weight of silver all chased, and 1500 of gold. Much beyond this was the display of that captured from Perseus, the wealthiest king of the age, the services of Antigonus and Seleucus-pattern, and the works of Thiericles, that noted master; though Plutarch has omitted to state the sum total of the weight.

and several fancy loaves, and house-pigeons, and ring-doves, and partridges, and all other sorts of fowls in abundance. "These dishes also" (to give Hippolochus' own words) "we handed over to our servants; and as we had had enough of eating we washed our hands. Then garlands were brought in for us in profusion, made out of flowers of every kind, and each of them contained a bandeau of gold equal in weight to the first wreath." After this Hippolochus describes how Proteas, grandson of Proteas son of Lamia the nurse of Alexander the Great, was a very hard drinker fully equal to his grandfather Proteas, Alexander's foster-brother; and how he drank to the health of every one present: and then he goes on with his narration as follows:—

3. "And now that we were agreeably estranged from sobriety, comes in a troop of female flute-players, singers, and some Rhodian dulcimer-girls, all naked as it seemed to me, though some would have they had on (thin) tunics, and after having given us a specimen of their skill, they departed. Thereupon enter other girls each with a pair of cruses of perfume tied together with a strip of gold, the one gold, the other silver, holding a *cotyls* (nearly half a pint) each, and presented them to every guest. Next is served up wealth instead of a course, an oblong dish of silver very thickly gilt, and large enough to receive the bulk of a pig roasted whole and of very great size; which was laid upon its back displaying its belly crammed with plenty of good things, for in the same were, baked together with it, thrushes, and sows' paunches, and an innumerable lot of ortolans, and the yolks taken out of eggs, and oysters, and scallops: and they were set before each guest and given to him dish and all. After this, when we had drunk off our bowls, we received each of us a boiled kid upon another dish of the same size as the

last, but enriched with myrtle-branches in gold. Hereupon Caranus, perceiving how much we were crowded, ordered hampers and bread-baskets to be given us, platted out of strips of ivory; whereat we were so delighted that we shouted in honour of the bridegroom, because what he had bestowed upon us was thus safely stored. Then came fresh garlands, and a double cruse of perfume, in gold and silver, of the same weight as the preceding. And silence being made, there enter the performers at the festival Chytra at Athens. After these came in buffoons and performers of feats of strength, and some female jugglers that throw somersets amongst swords set upright in the ground, and blow fire out of their mouths, being completely naked.

"4. When all these performers had gone off, hot and stronger drink succeeds; our wines being the Thasian, Mendæan, and Lesbian sorts, and gold cups of very large size being set before us. And after this bout a glass dish about *two cubits* in width, lying in a silver case, covered with baked fish of all sorts piled up, was given to all of us, together with a silver bread-basket full of Cappadocian cakes. Some of these we ate there and then, the rest we handed over to our attendants. Then we washed our hands and put on our wreaths, and were again presented with gold bandeaux of double the weight of those before, together with another double cruse of perfume. Then silence being proclaimed, Proteas leaped off his couch, and having filled a gold cup with Thasian wine and added thereto a few drops of water, he tossed it off exclaiming:—

'Who drinks the most will be the merriest.'

Thereupon said Caranus, 'Since you have drunk it off the first, accept the cup for a keepsake: and all the rest that

do the same shall get the same prize.' No sooner said than 'up got nine in all,' snatching at the cup, and trying the one to be beforehand with the other. But one of our fellow guests, poor fellow! not being able to drink it off, sat down again and began to weep because he had lost his cup: Caranus, however, makes him a present of the cup, empty. Hereupon came in a choir of one hundred persons singing in measure the nuptial hymn; and after them, female dancers attired some in the guise of sea-nymphs, others of wood-nymphs.

"5. As the drinking went on, and the time began to grow dusk, they open up the hall, in which the part surrounding us had been cut off entirely from the rest by hangings of white linen, and these having been drawn up, lights made their appearance by means of some concealed contrivance, as the enclosures burst asunder; Cupids, and Dianas, and Pans, and Mercuries, and many such like figures, holding silver lamps to illuminate the scene. Whilst we were admiring this piece of ingenuity, wild boars, truly Erymanthian in magnitude, laid upon square chargers ornamented with threads of gold, and spitted upon silver spears, were presented to each man. And the wonder was, how we who were by this time overcome by, and drowsy with drink, at the mere sight of the bringing in of these dishes, of a sudden became sober, and, as the saying is, got on our legs again. Our boys were therefore engaged in piling them into the fortunate hampers, until the trumpet gave the established signal for the last course, for this, as you know, is the custom with the Macedonians at their great banquets. Thereupon Caranus, opening this bout, bade the attendants go briskly around with small-sized cups. We sipped therefore at our leisure, taking it as it were for an antidote to our previous immoderate potations. In the mean time there

had come in the buffoon Mandryenis, the grandson, as they say, of the famous Strato of Attica, and made us almost split our sides with laughter, and afterwards he performed a dance with his wife for partner who was above eighty years old. At last came in the dessert, and we were presented with sweetmeats in baskets woven out of ivory, and the various kinds of cheesecakes, the Cretan, your own national Samian, friend Lynceus, and the Attic, together with the dishes containing the pastry. After this, we arose and took our leave, being fully sobered, of a certainty, by our anxiety on account of the treasures we had received. So whilst you staying at Athens think yourself happy in listening to the lectures of Theophrastus, feeding upon wild salads, and broth, and those fine twists of yours, and being a spectator of the Lensea, and Ohytra festivals, we on the other hand, who were at the feast of Caranus, having been regaled with riches instead of with meats, are now all seeking to invest them, some of us in houses, some in land, some in buying slaves."

MEDIÆVAL PLATE.

As soon as the social life of the Middle Ages had settled down into sufficient security for any class, besides the ecclesiastic, to enjoy opulence, and to venture upon the indulging in luxury, the nobles almost vied with their predecessors of the Lower Empire in the amount and elaborateness of the silver and even gold plate under which their sideboards groaned. This display of wealth did not begin to exhibit itself, as the rule binding upon all laying claim to fashion, much before the beginning of the 14th century, for Dante introduces old Cacciaguida, by three generations only his senior, contrasting the simple frugality of his own times with the extravagance in archi-

ture, dress, and mode of living of the poet's. But to look at the matter dispassionately, this very mode of investing surplus revenue, as soon as such a thing began to be, was the only one the times allowed besides that of burying it in the ground. To let out one's money at interest was a sin only fit for the Jews, to employ it in commerce was beneath the dignity of a noble, but to expend it in plate brought with it the gratification of vanity in prosperous times, and secured a bank to fall back upon in the day of trouble. Hence, until other modes of investment arose, equally secure, easy, and more profitable, every one who did not hoard the actual coin like a miser, converted his superfluous income into plate: and this continued the rule in England late into the 17th century.*

It was, however, in the times first spoken of that luxury in this article ran wild with all the grotesque extravagance of the age. What the strange genius of the Gothic designer tied by no rules could devise, with all the fantastic creations his great practical skill could effect in piling conceit upon conceit, now blazed forth in its full glory. A good idea will be obtained of the chefs-d'œuvres of this art-manufacture from the descriptions of a few pieces taken almost at random from the Inventory of the plate of Louis duc d'Anjou, drawn up between the years 1360 and 1368. It comprises 717 items, and the list then is incomplete, "several leaves being torn out," says Laborde, who has published it. Of such domestic plate only a few, and those the most inconsiderable pieces, have come down to our times. The general destruction of the class is due to two causes. First came the complete change of taste two centuries later, consequent upon the Revival, which consigned to the melting-pot, without pity, as heretic

* In the earliest London lotteries the prizes were given in silver plate.

against *Il Bello*, everything bearing the stamp of Gothic art, in order to remodel it into the semi-classic style then so zealously cultivated in all decorative matters. Next succeeded the 17th century, that epoch of civil wars devastating the whole extent of Europe: the bitterest poverty, oppressing each land in its turn, sent every ounce of plate that was not consecrated (and wherever the Calvinists got the upper hand that too sharing the general fate)* to the mint, to reappear in the rude coinage of the times † for the pay of troops, and to make the war support itself. It is needless to multiply examples: every one acquainted with numismatics knows how all the corporation and college plate of England was converted into the unshapely coins and yet ruder siege-pieces of the latter years of Charles I.'s reign. It was thus that the domestic plate entirely disappeared, the few examples left being the small articles either overlooked at the moment, or previously gone out of sight. Of that consecrated to religious uses, a tolerable sprinkling has been preserved: some was defended by the sanctity of the places containing it; some was in many cases rescued from plundering zealots by the precautions of its guardians, and restored to its wonted place in quieter times, and thus survived until its safety—though devotion, its former keeper,

* One of their captains in the Thirty Years' War struck thalers out of all the church-plate he could lay hands upon, marking their provenance with a certain grim humour by the motto, instead of legend, "*Gotte's Freund und Pfaffen's Feind.*"

† What incalculable destruction of art, as well as of historic interest, was represented by the two hundred pounds' weight of gold obtained by Cellini from the jewels of St. Peter's, which he melted down by command of Clement VII., when blockaded in Castel Santangelo by the Spaniards, in 1526! The hardly-bested pontiff was reduced to this expedient to save the precious stones belonging to these ornaments, which he sewed up in his own clothes and those of his confidant Cardinal Cornaro.

be extinct—is secured by its newly-created archæological value. Such pieces, however, being made for certain definite uses, generally to contain relics, are modelled after one pattern, that of a chapel, a coffret, or a bust, and exhibit little of the licentious ingenuity which designed the subtleties in silver that encountered the astonished guests at the tables of the dukes of Anjou, of their rivals of Burgundy, and, in a greater or less degree, of the wealthy merchants of Flanders and of England. The following items will fully bear out these observations; they are extracted from the accumulation of plate, mostly decorative, mentioned above.

“No. 76. A wheelbarrow resting upon a foot carved with vine-leaves, which rests upon iv little lions; the said foot is pointed before and behind, and at one of the ends is a man who has the handles in his girdle, and trundles the said barrow; and he has on a fur hood, and the point of his hood comes over his forehead: before him is a woman who with her right hand holds the barrow, and in her left holds a Danish axe, and wears an old woman's hood, the which hood is after the fashion of Picardy; and on the said barrow is a cask tied with several straps, and the ends of the said cask are enamelled in green and blue with several little beasts; and the bottom of the barrow and the resting-place of the goblet are of the same enamel, without any difference: and in one of the ends of the said barrel is a tap like that of a fountain; and the said rest for the aforesaid goblet is made with battlements, and iv leaves higher than the battlements; the which rest is fixed within the belly of the said cask, and does not take off. And the goblet which rests upon the said seat is of the same enamel above mentioned, and the bottom and the lid of the same enamel, and a little knosp in gold on top of the cover in the same enamel; and the foot, man, and

woman, weigh iv marcs i ounce; and the barrow, the cask, and its rest, weigh iv m. v oz.; and the goblet and its cover weigh iii m. ii oz. The whole xii m. i oz. (or 97 oz. Troy).

"No. 78. A Lady, who has half of her body a woman's, the other half a wild beast's, with her two feet upon a terrace, enamelled blue, with little trees, stags, and hounds, and mouldings underneath: from the girdle of the said lady comes out a bull's head, the horns whereof she holds in her hands; and on the said head is a cup;* and at the ears of the said head, at the sides of the lady, and at the ends of her girdle, hang by little chains escutcheons of the Archbishop of Rouen and of Marigny. And the said lady is wrapped in a little mantle, split at the sides, and has a long hood upon her head, enamelled the same, both mantle and hood; and behind the said lady, on the back of the aforesaid beast, is the rest for a goblet, made with flutings; and the said goblet is of crystal, and is mounted on a foot of silver enamelled, with flutings and mouldings; and round the crystal are iv *Bats*. The cover is of crystal, bordered with silver, with flutings and mouldings, and the knosp of vine-leaves, and the boss (of the stem) of the same is three-sided, enamelled in blue and green. The lady, the foot, the goblet and cover, weigh v m. vii oz. xii d. (47 oz. 12 dwts.).

"79. A Cook, forming an ewer, whereof the body and tail are of pearls; the neck, wings, and head, of silver, enamelled yellow, green, and blue; and upon his back is a fox, which is going to seize him by the crest; and his feet are upon a base, enamelled with children, who are playing at divers games; and he weighs altogether iv m. iii oz. (35 oz.).

"81. A great *languier* (tongue-tree) of silver-gilt, which has several branches, at the end whereof are xv

* The head forms the cup.

serpent's tongues, and between the tongues, at the end of other branches, be stones of divers colours; also there be dispersed about the said tree several stones hanging from little chains of silver and gold; and in the middle of the said tree is a great white *cameo*, and around this are iv other stones, to wit, ii garnets and ii green stones; and in the stem of the tree is a boss* engraved with leaves raised, and about the said boss be vi little enamels in blue, with a fleur-de-lys in gold; and inside the said stem, within, is a square basin, having underneath a square boss with iv enamels of birds in blue; the foot is a square entablature with iv enamels set therein, in which be ii serpents folded, and ii birds: towards the bottom it is moulded and fluted, and rests upon iv lion's paws. Weight of the whole v m. iii oz. (43 oz.).

"89. A Fountain, of which the foot rests on iv gilt paws, and underneath is a terrace in green, a little crossed (hatched), of which the enamel is green, and the fishes violet and yellow. And in the middle of the same terrace is a tree from whence issues a serpent winged, and in the top of the head of the same is a pipe, and a tap out of which the water issues. And at one of the ends of the said terrace is a little tree, whereon sits one ape clad in a coat and surcoat, very wide, and hath a hood upon his head whereof the fur is violet, bedropped with drops of white, and the top of azure with white and red drops, with a pearl on the end; and the said ape holds in his left hand a fishing-basket, and in his right a fishing-line, wherewith he hath caught a barbel. And at the other end of the same terrace is another ape dressed and hooded the same as the first. And he holds in his right hand the tall pipe of the fountain, and drinks at it. And the

* This *pommel* is the boss which usually surrounds the middle of the stem of a mediæval cup.

basin above of the said fountain is enamelled in green with rabbits and dogs. And the said basin is supported on three branches, the leaves whereof be enamelled in green, blue, and yellow. And upon the said basin rests a goblet, enamelled on the outside with green and blue, with spaniels and children chasing butterflies; and the enamel is on the inside of the goblet as well as out. The cover outside is also enamelled, with children chasing butterflies, and has a knosp enamelled in azure, and weighs in all viii m. ii oz. (66 oz).

"No. 165. A great Flagon, gilt and enamelled, on the belly whereof are ix enamels; and that in the middle is large, in the shape of a rose, and in it there is a lady sitting on a chair, who has in her lap a basin, wherein are florins, and at each side of her are women to whom she is giving the florins; and under the feet of the said lady is written *Liberalitas*: and in the other enamels are the seven deadly sins; and the eighth enamel portrays *Vana Gloria*: and also there are viii half-circles, wherein be divers beasts. The sides are interspersed with several round enamels and wild beasts; and on the flat of the said flagon is a large enamel, round and blue, in which is an ancient lady sitting in a great chair, and under her feet is written *Theologia*, and all round are viii enamels, in which are the vii cardinal virtues, and to each one its name close to itself. The said flagon is upon a foot, high, carved, bell-shaped, set with iv enamels, wherein be men playing on divers instruments. The neck of the said flagon is in the fashion of a tower with vi pillars, and between every two are blue enamels; and the cover is tall, after the fashion of a steeple, with blue enamels, and from the top is fastened a chain, which goes to the straps by the hinge, and the straps are green, set over with large blue enamels, and between every two enamels are two others

made like a J reversed, and they fasten the said straps to two little serpents, which have been blue. Weight xxx m. vi oz. (246 oz. Troy).” *

The gold plate consists of sixty-seven pieces, generally of more simple make; *hanaps* and goblets, dishes, cruets, spoons; including, however, some curious items, as

“258. An Ewer of gold, whereof the foot is small and round, carved with *Saracenic letters*, and above this is a little boss round and plain: the mouth of the said ewer is wide, and the bottom pointed, and around its belly runs a lily carved with *Saracenic letters*. And at the cup are iii pipes, two above and one below; and the cover is carved and worked after the same fashion as the belly of the said ewer; and on the border of the cover are ix large pearls; and upon the knosp a large sapphire between two very big pearls and two sapphires. Weighs in all iv m. ii oz. (34 oz. Troy).

“203. A great Hanap of gold, tripod-fashion, which iii serpents uphold; and the said hanap and its cover are enamelled with serpents of their proper colours, entwined with our coat of arms; and on the cover is a large sapphire mounted in the knosp. Weighs in all x m. ii oz. (82 oz. Troy).

“210. An Ewer in crystal, mounted in gold, and on the cover is a little dove holding a pearl in her beak, and below are vi others, larger, weighing, gold and crystal, iii m. vi oz. (30 oz. Troy).

“256. A Goblet of gold, resting on a little round foot carved with *Saracenic letters*, and between the goblet and the foot is a round boss quite solid, and above this a lily, which embraces all the goblet, of which every leaf is carved with *Saracenic letters*, and at the bottom is an

* The total weight of the silver plate is summed up at 8036 m. or 5357 lb. 4 oz. Troy.

enamel of clear red, in which are iii lilies and iii Saracenic knots; and the field of the said enamel is chequered with the same colour, and the cover is of the same pattern. And between the boss and each lily are ii big pearls, 'à moulinet,' and the number of the pearls is xx; and upon the knosp is a large sapphire, set between two other sapphires and two very big pearls; and inside the cover is a small enamel with the same device as that on the bottom of the goblet. Weighs in all iv m. iv oz. xii d. (36 oz. 12 d. Troy).

"268. A Saltecellar of a pearl-shell, made in the shape of a heart, and resting upon a little wheelbarrow of gold; and there is a woman who pushes at the wheel and holds the axles with her two hands; also a man wheeling the barrow; and around the barrow several rubies of Alexandria, pearls, and other stones; and on the cover of the said salt is a knosp on which is a sapphire. Weighs in all i m. vii oz. vi d. (15 oz. 6 d. Troy).

"269. A very large chalice of gold, the foot of which is round and flat, adorned with mouldings, and on the flat of the foot is an enamel in bright red, on which is Our Lord on the Cross, Our Lady, and St. John; and in the middle of the stem is one round boss carved with leaves; and the cup of the said chalice quite solid, and weighs vii m. ii oz. xii d. (58 oz. 12 d. Troy). The *paten* also is quite plain, save that in the middle of it is an enamel in bright red of Our Lord in a cloud, sitting upon his throne, and showing his wounds; and the *paten* weighs ii m. iv oz. (20 oz. Troy)."

The prince makes a note that Henri, his goldsmith, had then by him 248 m. of gold for the making of the great *Nef* which he had in hand. Including this, the weight of the gold plate amounted to 1303 m., or 868 lb. 8 oz. Troy.

As the most fitting conclusion to this list of things that have passed away for ever may be added a description of the sole relic (that can be identified) now in existence of the incredible wealth of ancient Mexico in such articles of ostentation. It is a gold goblet, with the sides rudely repoussé with the representation of a human head: on one side, in full face; on the other, in profile; on the third, the back. This cup seems to be of pure gold; it was brought from Mexico, and purchased at Cadiz by Edward, Earl of Oxford. It is stated to have belonged to *Montezuma*. There can be little doubt that the work is ancient Mexican. Height, $4\frac{1}{2}$ in.; diameter of lip, $3\frac{1}{4}$ in.; weight, 5 oz. 12 d. (Earl Amherst).



AURUM: *Xρυσός: Gold.*

PLINY (xxxiii. 19) launches out into a set of reflections in his own quaint style, astonished as to what possible motives could have induced all mankind to make Gold, wherever known, the first and chiefest representative of value. It was and is indeed a strange coincidence in the notions of races, however remote from or unconnected with one another, that must early have puzzled every observer, and which still remains a problem admitting of no satisfactory solution. "It was not so accepted," pursues the old naturalist, "on account of its utility, in which point it yields immeasurably to iron; nor for its heaviness or ductility, in both which lead surpasses it [which however is far from true]; nor yet for its colour, for *yellow* is not particularly admired in other things. The only reason, therefore, must have been its indestructibility, for gold is the only substance known that resists the fire, and is no more than improved by repeated fusion."

But this explanation, however satisfactory to the refined philosopher, is evidently much too transcendental to have influenced the primæval savage mind to which the metal hath ever been to the full as precious, though existing only in the shape of a personal decoration, as to the civilized intelligence which sees therein concentrated power, pleasure, and the veneration of his fellow mortals.

In spite of Pliny's dictum, the universal love must in the first instance have been won by its *colour*, a colour certainly the most gorgeous of all: and the reason is mani-

fested in its name, derived from *Our* and *Or*, words denoting in many ancient languages the light of day; the earliest synonym for life and all that is to be desired. Some of the ancients had perceived this, though Pliny dismisses their explanation somewhat contemptuously with "*manifesto errore eorum qui colorem siderum in auro placuisse arbitrantur.*" The golden nugget, glittering amongst the pebbles of the stream, caught the eye of primitive man, who saw in it the image of the sun, the oldest object of worship, and of whom gold has ever since continued the symbol. Nay more, the Sun-god gave his own name *Electer*, with the Greeks, to native-gold as well as to Amber (*electrum*), and, in return, the Indian *Sone*, 'gold,' is the parent of the Teutonic 'Sonne.' Besides its beauty, its ductility was another recommendation; the savage, though unacquainted with metallurgy, readily beat the pure ore into circlets to adorn his limbs: for this and copper are the only metals capable of being utilised by man in the first stage of civilization.

The rarity of Gold is far from accounting, as some would have it, for its universal estimation. Amongst the primitive Celts of the Bronze Age, or the Mexicans when discovered by Cortez, *iron* must have been infinitely more novel and more rare, yet did it not on that account diminish in the least degree the ancient veneration for gold. And modern times are not wanting in similar analogies; platinum in the last century did not supplant gold either in the mint, or in the jeweller's shop, though superior in those three great constituents of value—weight, ductility, and indestructibility,—besides being then of an equal intrinsic worth; neither in our own days did aluminum, though so highly recommended by its novel beauty of colour, perfect purity, and, at the first, extreme costliness. Rarity alone does not constitute value; amongst the

precious stones, for example, there exist varieties (the Cymophane, the Blue Topaz, the Red Tourmaline, for example,) pleasing also to the eye, vastly more difficult to be obtained in perfection than the Diamond, and nevertheless they are sold for the merest trifle as mineralogical specimens. The golden flood poured into Europe during the last sixteen years from California and Australia has not lowered the value of gold; and similarly, despite the *tons* of diamonds (things indestructible) imported since the discovery of the Brazilian mines a century ago, that gem yet maintains its original price and estimation.

From the earliest times of which we have any record, Gold was abundant amongst the nations of Asia Minor, as the constant allusions to it in Homer's poems sufficiently attest. He however does not in any place mention, even incidentally, as might have been expected, the sources whence it was then obtained. The first hint as to these is obtained from Sophocles, who talks of purchasing the *electrum* of Sardis and the gold of India ('Antig.' 1038), thus indicating the regions whence the supply was chiefly drawn. But Herodotus soon afterwards furnishes copious details concerning the gold-mines known in his times, some fabulous enough, others, resting upon his own knowledge, of the highest value for authenticity.

To begin with the latter.

The little island of Siphnus was in the preceding generation the most flourishing of all the Greek insular states by reason of its mines of gold and silver. The people were advised by the oracle to dedicate the tithe of each year's produce to Apollo, and consequently built a treasury at Delphi as well furnished, says Herodotus (iii. 57), as those of the greatest republics of Greece. Pausanias (x. 11), after repeating the above account, supplies a singular reason for the failure of the mines. The Siphnians had,

out of greediness, ceased to pay the promised tithe, "and so the sea broke in and drowned their workings." There is one point of value in this tradition; it proves that the Siphuians extracted the ore from cuttings, perhaps, from galleries in the quartz rock, and not from gravel-washings; so that the auriferous strata must still exist in a greater or less degree on the shores of that almost unknown island.

The gold-mines in Thasos opened by the Phœnicians, who first colonised that island, made "a whole hill turned upside down in the search," between *Ænyra* and *Cinyra*, opposite to Samothrace. The Thasians were then working also mines in *Scapte-Hyle*, on the mainland of Thrace: these produced 80 talents yearly,* those in the island itself rather less (vi. 46). A learned traveller who visited the former locality not long ago was greatly struck with the enormous extent to which these ancient workings had been carried, still manifested by the vast heaps of earth and stones thrown up out of the "diggings." Whenever it was possible the ancients extracted all metals by open cuttings, as the vestiges of the Roman iron-mines in the forest of Dean still abundantly manifest.

But infinitely more productive (as is always the case) than these Thasian *Mines*† were the *gold-washings* (in modern phrase *Placers*) in the bed of the *Pactolus*, whose torrent carried down, it was believed, the gold-dust from Mount *Tmolus*. Some notion may be formed of the immense

* These 80 talents = 4860 lbs. Troy nearly, or 240,000*l.*, putting the Troy pound at 50*l.* For the sake of convenience in calculation, I put the talent throughout at 60 lbs. Troy by weight, although the coins indicate it was nearer the same *avoirdupois*. The later talent (Alexandrian), known to the Romans, is often used indiscriminately with "*centenarium*" or the hundredweight. This accounts for Varro's (quoted by Pliny) estimating the silver talent at 6000 *denarii* (240*l.*) in Roman currency. I therefore give its value, roughly, at 200*l.*

† Xenophon ('*Hellen.*' iv. 8, 37) mentions also gold-mines of the *Abydenes*, near *Cremaste*.

weight of gold collected by the Lydian washers (who appear speedily to have exhausted the deposit, as the productiveness of the Pactolian sands is not afterwards alluded to by geographers), from the list of the *Donaria* consecrated by Alyattes and Croesus at various temples in Asia and Greece, all of which Herodotus had himself examined. This gold is properly termed by Sophocles *Electrum*, being very pale (similar to the Californian) from the large native alloy of silver it contains. As it is a very difficult operation in metallurgy to separate this silver, the earliest coinage, ascribed with justice to the Lydians, and the oldest jewelry, as the Egyptian and Etruscan, is made in this pale gold. In fact, it continued to be used in the currency of the Greek cities of Asia Minor (Cyzicus, &c.) down to the times of Alexander: perhaps it was found to wear better in circulation through the existence of the native alloy; and the saving of the expense in refining it was of importance to the mint. But it was from ignorance of the necessary process that the currency of the Gauls and Britons was struck in the gold just as it comes from the washings, which in these regions is of very strong alloy, containing a good deal of copper as well as silver.

Herodotus (iii. 16) states it as a well known fact that there was an abundance of Gold found in the North of Europe, but had been quite unable to ascertain anything as to the mode in which it was procured, treating as quite unworthy of credit the tale of the Arimaspi, the one-eyed race, stealing it from the custody of the Gryphons. By North of Europe the North-east is intended, for his Arimaspi are placed to the east of the Araxes beyond the Issedones. Neighbouring upon the latter are his Masagetæ (i. 201), who have gold and copper in abundance, but neither silver nor iron. From these geographical data

it is pretty evident that these Scythian (or Cossack) tribes prosecuted with considerable activity the trade of washing for gold-dust the sands of the Uralian streams, still so productive in the same way. The Tartar tumuli covering the regions to the north of the Black Sea testify to the truth of these assertions by the immense quantity of gold ornaments, belonging to widely separated historical periods, which have long rewarded the Cossack and Russian treasure-seekers. In some the corpses of mediæval Khans have been discovered wrapped up in a complete winding-sheet of gold, in others numerous rude figures of purely Tartarian origin; others, again, contain works showing some influence of Grecian taste.

The same historian quotes, on Carthaginian authority (iv. 195), a tale of an island, Cyraunia, off the Libyan coast, where there was a lake out of which girls drew up the gold-dust out of the mud by means of bunches of feathers smeared with tar and tied to long poles. This story he seems to doubt. He likewise describes, on the same authority, how their traders bartered merchandise against gold in a certain locality on the African Coast beyond the Pillars of Hercules, probably near Senegal; or indeed they might have coasted along as far as the Guinea Coast. No further mention is to be found of gold from Africa; and, still more extraordinary, he does not allude to the very extensive workings carried on in his days in Egypt. The first may be explained easily: the Carthaginians kept all their gold at home, they had no metallic currency, (until a much later period, and then only issued for their colonies), but used *leather* bank-notes, and their exports were entirely manufactures, which in all their commerce they bartered against the precious metals.

As for India, whence the Persian kings derived a large amount of Gold as tribute (equalling 21,600 pounds Troy

annually) he had obtained no real information. The Persians told a story of the northernmost Indians, next to the Bactrians, who went out into the sandy Desert on camels to steal the gold-dust that was scraped up by enormous ants "somewhat bigger than foxes."* But this metal was then, as now, procured from Thibet by caravans, for India itself had then no gold-mines, as the Greeks under Alexander found to their inexpressible disappointment. India drained the Roman Empire of gold in return for its gems, spices, and silk, as it, with China, does Europe at the present day of its silver. The *Periplus of the Red Sea* gives an exact notion of the Roman trade with that country; the Indian exports were then precisely the same as they were a century ago, or before the cotton manufacture was naturalized in Europe. The Romans paid for all this in ready money, having no commodities except amber, coral, copper, and lead, to exchange for these Indian productions.†

Yet, from whatever source derived, the quantity of gold accumulated by the princes of Asia Minor was absolutely incredible. The gold-washings of the Pactolus alone had furnished the gifts sent by Croesus to Delphi; seen by

* Of which extraordinary insects the King of Persia kept some alive as curiosities! But Herodotus does not here speak as an eye-witness.

† "There not being a year in which India does not drain the empire of above half a million sterling (HS. DL), and sends in return merchandise sold amongst us at a hundred times the prime cost."—Pliny, vi. 23, xxxiv. 48. Compare this complaint with the following extract:—
WHERE THE MONEY GOES.—In the year 1863 the bullion, gold and silver, imported into India exceeded the export of bullion from India by a value of 19,398,315*l.*—namely gold 6,848,159*l.* and silver 12,550,156*l.* In 1864 the import exceeded the export by 21,622,751*l.*—namely, gold 8,893,394*l.*, and silver 12,736,417*l.* The total thus absorbed in India from the year 1800, has exceeded 256,000,000*l.* The bullion, gold and silver, coined in India, amounted to 9,882,132*l.* in 1863, and 11,479,685*l.* in 1864, and the total from the year 1800 has exceeded 231,000,000*l.*—*The 'Times,'* June, 1865.

Herodotus himself, and of which he has recorded the weight (i. 50). There were 117 oblong ingots (*ἡμπαλίσθια*), each 18 inches long by 9 wide and 3 thick. Of these four were of refined gold, weighing each $1\frac{1}{2}$ talent (90 lbs.); all the others of "pale gold," i. e. electrum, and weighing each 2 talents (120 lbs.); a distinction proving clearly the difficulty then experienced in separating the native alloy from the metal. Besides these he sent a lion (the national emblem) weighing 10 talents (600 lbs.), which still existed, though it had lost $3\frac{1}{2}$ talents of its original weight in a conflagration of the Temple; a basin weighing $8\frac{1}{2}$ talents and 12 lbs. over. Also a female figure (his cook) $4\frac{1}{2}$ feet high, weight not specified; besides many other objects in gold, sent thither, to the oracle of Amphiaraus, and to Thebes. His offerings at Branchidæ were reported to have been the counterpart of those sent to Delphi; an arrangement quite in the spirit of those times. So large a weight of metal given away at once appears at first fabulous, but it is probable that Croesus was the first Lydian king to explore these virgin gold-washings, and that every ounce collected went into his treasury. The one circumstance may be inferred from the fact that his father Alyattes, though equally anxious to testify his gratitude to the Delphic god, had sent nothing in gold, but merely a large vase in silver, and a stand for it in iron, valuable solely as a novel specimen of workmanship. That the gold-dust was carried into the royal treasury in its native state appears from the amusing anecdote of his allowing the Athenian Alcmeon, as a reward for his kindness to his envoys, to carry off from a heap as much as he could stow about his person (vi. 125).*

* By this restriction the king, doubtless, expected to get off at the cost of a belt-full of his new staters, with a weighty wreath, torques, and bracelets to match; but the wily Athenian was not the man to

The Lydians, adds the historian, were the first of men recorded to have coined money of gold and of silver. He does not mention under which of their kings, but numismatists agree in naming 'staters of Croesus,' and with some foundation, those oblong lumps of electrum weighing a Daric, but of evidently anterior make, stamped with the fore-part of a lion and a bull *regardant*, the design purely Assyrian, and declaring its origin.

Before the reign of Gyges the Pythian Apollo possessed neither gold nor silver, says Pliny (xxxiv. 10), quoting Phaneas of Eresus. Yet Herodotus (i. 14) makes Midas to have set him the example, by dedicating his own royal throne, which was still to be seen when he wrote, and a work to be admired. But Gyges, it is true, far surpassed him, his being the greater part of the offerings in *silver* then existing at Delphi; and in gold he had presented, besides other articles, six craters, weighing in all 30 talents (1800 lbs.). After him came Croesus, whose munificence has just been detailed. Of the Greeks, the first to offer the precious metals was Gelo, at the time of the invasion of Xerxes, who gave a Victory and a tripod in gold. After him his brother Hiero made a donation exactly similar.

This account of the quantity of gold then amassed in a profit so slightly by the golden opportunity. Having, therefore, put on the largest and longest tunic, with the highest and widest boots he could find, he entered the treasure-chamber; and, falling upon a heap of gold-dust, first of all filled therewith all the space between his boots and his legs, then the lap of his dress, next powdered well with the finer particles his hair worn long and curled after the Archaic fashion; and lastly, for want of another receptacle, stuffed his cheeks to bursting with so much more of the precious flakes. In this condition he waddled out, scarce able to drag his legs after him, and "looking like anything rather than a human being," to the infinite amusement of Croesus, who was so tickled with the joke, though at his own expense, that he rewarded his ingenuity with the gift of as much more gold as he carried about him. This was the origin of the opulence of the family Alcmaeonidae.

single treasury is corroborated by what the historian relates of Pythius, a Lydian, in the next generation to Croesus, after the country had become subject to the Persians. This person, though only a private man, offered Xerxes (besides silver to an incredible amount) four millions, less seven thousand, of gold darics, each of which weighs one of our guineas (vii. 20). He had, some years before, presented his father, Darius, with *the* plane-tree and vine of solid gold.

The annual amount of tribute paid into the treasury of Darius was 14,560 Eubœic talents; out of which Herodotus remarks (iii. 95) that the gold-dust weighed 360 talents. The latter was paid in by the Indians, and equalled the entire assessment of all the other tributaries.* That this "360 talents" signifies the weight appears from its reduction (in the ratio of 13 to 1) to Eubœic silver talents, in which denomination it came to 4680. The whole was melted down and run into pots of clay, which were then removed, and a round ingot (like a Chinese tael) remained until required. Besides this store of ingots, an enormous coinage of darics in fine gold had been issued in the same reign, as the tale of Pythius shows, and continued to the epoch of the Macedonian conquest.

The Persians, in the reign of Justinian, had gold-mines at Pharangion in Persarmenia (Procop. Bell. Pers. i. 15). This was probably the source of the gold-dust so plentiful in Colchis in the earliest age of Grecian enterprise; for Pliny has a notice (xxxiii. 15) of "Saulaces king of Colchis, who, having got possession of a soil still virgin, extracted

* The Indian tribute was paid entirely in gold; and Herodotus evidently means that it equalled the weight of the same metal paid in by all the other subject-nations collectively; some of whom, like the Lydians and Colchians, must have contributed large amounts of that metal.

an immensity of gold and silver in the region of the Suani, and in other parts of his kingdom famous for the *golden fleece*." To the present day the Chinese miners in Australia employ sheepskins to collect the gold-dust in their washings.

An interesting account of the Persian treasury is preserved by Athenæus (xii. 514), copied from the biography of Alexander by Chares of Mitylene: "Close to the king's bed there was overhead a chamber in which were always kept 5000 talents (300,000 lbs. in weight) of coined gold: this was called the king's pillow. At his feet was another chamber, somewhat smaller, wherein were always kept 3000 talents of silver coin: this was called the king's footstool. In the bedchamber there was a vine in gold (the gift of Pythius?) set with gems, spreading above the couch. This vine, according to Amyntas, had bunches of grapes made out of the most precious gems." For the sake of comparing the revenues of the two greatest empires the world has ever seen, take this glance at the Roman treasury when at its fullest, as Pliny observes (xxxiii. 17). This chanced to be precisely at the moment when Cæsar upon his first entry into the metropolis appropriated its contents without ceremony, drawing out in gold ingots 15,000 pounds weight, in silver ingots 30,000, and in coined silver 300,000.

The captured treasures of Mithridates, the spoils of Asia, raised (says Plutarch) the Roman revenue from fifty millions of denarii (2,000,000*l.*) up to eighty-three at one stroke. Besides this accession of annual revenue, the amount of 20,000 talents in specie and plate was brought by the same conquest into the treasury.

Polybius describes the Median palace at Ecbatana (x. 27) as having all its timber-work, though of cedar and cypress-wood, the beams, the ceilings, and the pillars, entirely plated over with *scales* of gold and of silver; the tiles being

all of the latter metal. Of these the greatest part had been scraped off at the time of the Macedonian invasion, and under Seleucus and Antigonus; yet still the temple of Aene retained its gold-plated columns and silver tiles; and a few ingots of gold and several of silver were piled up within it. All these "scrapings" were got together for the Royal mint, and fell little short of 4000 talents.

Agatharchides of Cnidos has left a most valuable description of the manner in which the mines in Egypt were worked, and the metal refined, in his own times (the reign of Ptol. Philometor, B.C. 181); but these operations had been carried on in the same district for many centuries before the establishment of the Greek power (Diod. Sic. iii. 13).

"In the furthest part of Egypt, on the confines of Arabia and Ethiopia, there is a place containing many mines of gold, which is procured by numerous workmen with vast hardship and expense. The soil being naturally black, and containing many veins and strata of marble, extremely white, and thus distinguished from the circumjacent materials, the superintendents set over the mining-works prosecute the search with a multitude of labourers. For the kings of Egypt collect those condemned for crimes, captives taken in war, persons ruined by false accusations, and therefore sentenced to imprisonment, sometimes alone, sometimes with all their families, and condemn them to the mines, thereby at once inflicting punishment upon the sentenced, and extracting large profits out of their labours. Now these convicts, in great numbers, all in fetters, are kept at the works, not merely all day, but throughout the night also, getting no intermission of labour, and carefully guarded against escaping. For guards are set over them of foreign soldiers, and speaking a different language, so that it is impossible for the prisoners to corrupt any of

their keepers by speech, or by motives of humanity. The ground containing the gold they first heat with long-continued fire, and so render full of fissures, before they apply manual labour to it; but the rock that is soft and capable of yielding to moderate exertion is cut down with the tools stonecutters use by myriads of these poor wretches. The entire operation is directed by the engineer, who looks out for the proper stone, and marks it off for the labourers. Of those appointed to this miserable task, such as are of the strongest make break down the marble-like rock with iron pickaxes, applying no art to their labour, but mere brute strength, and thus cut galleries, running not in a straight line, but guided by the direction of the white veins. These men, in consequence of the crooked course of the galleries, work in darkness, and carry therefore lamps ingeniously fastened upon their foreheads; and frequently changing their posture, according to the arrangement of the veins, they break down and bring to the floor the fragments of the cut rock, doing this under the lash and cruelty of an overseer. Meanwhile the boys, creeping into the passages, throw up, with much toil, the broken mineral as it falls little by little, and carry it up into the open air at the mine's mouth. Here those above thirty years old receive from them a fixed measure of the broken ore, and pound it in stone mortars with iron pestles, until they reduce it to the size of a vetch. From these the granulated ore is taken by the women and the older men, who have many hand-mills set in a row, and, standing two or three together at the handle, they grind the measure given to them as fine as flour.

“Last of all, the skilled workmen receive the ore ground fine, and complete the operation. They have a board placed somewhat sloping, on which they throw a small quantity of the dust, and pouring water over it they rub

it. Then the earthy particles are dissolved by the water, and run off, owing to the slope of the board; but those containing the gold remain upon it in consequence of their weight. Repeating this frequently, first of all they rub the dust gently with their hands, afterwards they press it with coarse sponges lightly, taking up in this way the loose and earthy part, until the gold-dust is left behind unmixed. Finally, other workmen, taking from them the collected dust, according to weight and measure, place it in earthen crucibles, mixing, in a certain proportion, lead-ore and lumps of salt, to which they add a little tin and barley-bran. Then they fit on the cover of the crucible, luting it down carefully with clay, and bake it in a furnace five days and nights continuously. Then taking it out, and leaving it to cool, they find nothing of the other materials left in the crucible, but get the gold quite pure, although slightly diminished in weight. The discovery of these mines dates very far back; probably they were found out by the ancient kings" (meaning the Pharaohs).

It may here be remarked that this method of refining the dust was a very perfect operation, as nothing can exceed the purity of the gold issued by the Ptolemies, under whom this writer flourished. Yet it is certain that the native Egyptian metal contained a large alloy of silver, for the jewelry of the independent dynasty is invariably of electrum, or little better. Sir G. Wilkinson has observed that wherever the rocks in any part of Egypt show veins of quartz they exhibit traces of former exploration by the ancients in search of gold, the quartz lying about in fragments, broken very small in order to discover the traces of the precious filaments.

The Gauls, on the first invasion of their country by the Romans, possessed enormous quantities of gold made up into torques and armlets. These were not the spoils of

more civilised countries, for they appeared thus decorated on their first invasions of Italy and Greece—Virgil's Gauls scaling the Capitol, "*lactea colla, auro innectuntur.*" Caesar's conquest of that country so flooded Rome with gold, that, according to Suetonius, the pound weight was exchanged for only 3000 sesterces, or 750 denarii, or 1 : 8, (the *modern* proportion being 1 : 16); but it must be remembered the Gallic native gold is of a somewhat low standard, holding copper as well as silver. It is evident that no attempt was made to refine it: the gold was converted into torques or coin exactly as it came from the *washings*. Diodorus Siculus, a contemporary of Julius Caesar's, leaves no doubt upon the first point. His words (v. 27) are, "In Gaul silver is not found at all, but gold in plenty,* which nature supplies to the inhabitants without either mining or any trouble. For the course of their rivers, being full of sinuosities, and dashing against the banks of the adjacent hills, breaks off vast mounds of earth, and fills their streams with gold-dust. This the people engaged in the trade collect, and grind and pound the clods containing the gold. Then removing what is earthy, by means of re-

* The abundance of gold in the form of nuggets and flakes anciently procured by washings in regions now unproductive may be thus accounted for. All veins of gold lying in their original quartz matrix are richest at the top, and diminish in value as they run deeper until their entire extinction. The surface rock, readily disintegrated by the weather, suffers the rich lumps contained therein to fall amongst the débris and to be carried away by the rains, and thus we find pure masses of metal near strata now containing only threads and specks of gold, the former being the sole relics of the rich superincumbent stratum. And this disintegration of the rock proceeds with infinitely greater rapidity than could have been supposed. An old Californian gold-seeker, who had made a large fortune by gold-washing and lost it all again in much less time by an attempt to decuple the same by steam quartz-crushing, informed me that the broken quartz, after a few weeks' exposure to the weather, falls to pieces almost like so much quick-lime, and thus greatly facilitates the next operation of stamping it.

peated washings, they commit the residue to the furnace for smelting. In this way they amass an immensity of gold, and use it up for ornaments, not merely for the women, but the men. For round their wrists and arms they wear bracelets, round their necks thick circles of solid gold, and finger-rings of marvellous size, and even golden breast-plates. There is a peculiar and extraordinary custom prevailing amongst the Gauls in the interior with regard to the temples of their gods. In these sacred grounds and in the shrines there lies thrown upon the ground gold in abundance, dedicated to the deities, which, out of superstition, none of the natives dares to touch, although the Celts are naturally extremely covetous."

When the Consul Cæpio took Tolosa, the capital of the Tectosages (B.C. 112), he seized upon the treasure deposited in the temple of Minerva there, amounting to the enormous sum of 15,000 talents (about 3,000,000*l.*) A large portion of this was the spoils of the Greek shrines, the offerings of the returning troops of the second Brennus,* some two centuries before. This sacrilege brought so much evil upon Cæpio that "*aurum Tolosanum*" passed into a proverb for all ill-gotten gains attended with a curse.

The tradition of the riches of these Gallic temples has been of late singularly confirmed. A peasant (1832), digging for treasure in a ruined Druidical circle near Vieuxbourg, S. Quentin, was for once lucky enough to hit upon what he was seeking after in the shape of a hoard of torcs. They were ten in number, with one bracelet,

* Rather "Belgians." *Brennus* is the mere title *king* (Brennan, Welsh). They had slain in battle, B.C. 279, the King of Macedonia, the usurper Ptolemy Ceraunus, had thoroughly ravaged that country, and therefore may be supposed to have loaded themselves with the accumulated treasures of the great Philip.

some very elegantly ornamented and of great weight, the heaviest being 49 oz., the rest from 30 oz. upwards. The total value (merely by weight) was about 1000*l*. Unhappily, not meeting with a purchaser in their form of relics of primal Gallic art, the entire lot was ruthlessly consigned soon after to the crucible. They will be found accurately figured in the '*Archæologia*' for 1838.

The Gauls wherever they went seem to have possessed an instinctive faculty for discovering gold. Those settled in Upper Italy were as rich in the metal as their brethren beyond the Alps. When the consul Corn. Nasica triumphed over the Boii (a.d. 159) there were carried in the procession "upon the Gallic waggons" no fewer than 1470 torces and 250 pounds by weight of gold, besides silver vessels weighing 2340 pounds "made (in the national taste) with some degree of skill" (*non infabre suo more facta*); a singular notice on the part of the old annalist transcribed by Livy. But as their fertile plains had formerly been possessed by the Etruscans, those unrivalled goldsmiths of the ancient world, it may well be that the art yet lingered there under the savage conquerors, and this would explain the so frequent appearance of Græco-Asiatic patterns in Celtic ornamentation. It is evident the Celts imitated to the best of their ability the coinage of the Greeks: the same rule may be supposed to apply to their other works in metal.

Gallia Comata contributed crowns of gold to the weight of 9000 pounds, to the display of treasure at the triumph of Claudius over the Britons, whereas Hispania Citerior, the actual seat of the mines supplied no more than 7000 pounds' weight. Manilius was therefore justified in giving Gallia the epithet of *Dives* in the reign of Augustus.

This supply of gold lasted for many centuries. Procopius ('*Bell. Goth.*' iii. 33) records that the Frankish king

Theodebert struck gold coin from the metal furnished by the mines of the country: an assumption of the imperial prerogative extremely galling to the pride of Justinian; Procopius remarking that even the Great King (of Persia) refrained, out of deference to the Romans! from issuing a gold currency with his own image upon it.*

The sands of the Rhine below Basel are still washed every summer for gold-dust by the peasantry of the grand-duchy of Baden, as are also those of the Aar below Bruhl. The return is but trifling at present, five francs' worth (which represents little more than one pennyweight of the metal) being the utmost obtained by each washer from a day's labour. Gold also exists in the quartz matrix in Switzerland. I have seen a small specimen extremely rich in fine filaments of the pure metal.

Astonishingly productive of gold was the soil around Aquileia, but it seems to have been quite exhausted before Pliny's times. These workings, Polybius says, were discovered in his own age. The gold was first met with at a depth of no more than two feet, and did not extend deeper than fifteen. The grains were as large as a bean, or a lupine; and so pure as only to lose one-eighth in the melting. Another kind required more smelting, but yielded amazing returns. At first the natives allowed Italians to work with them, but in two months after the discovery the price of gold throughout all Italy fell by

* It strongly displays the persistence of national usages in the East that, as under the Sassanidae, so in modern times the currency of Persia should be exclusively of silver. Chardin notices this as the case in his time (1670-80), when the largest denomination minted was the *Abassi*, a piece corresponding both in size and value with the principal coin of the ancient monarchy. The extremely rare aurei of Varanes and Choeroes must have been coined for the same purpose as the gold *ducats* struck by the Shah on his accession and on New Year's-day, as medals for distribution, not for current money.

one-third: whereupon the Taurisci expelled all foreigners from the "diggings," and monopolized them for themselves.

The gold ornaments, and coins struck in ruder imitation of the Gallic (themselves caricatures of Philip's staters), found so frequently in England and (as regards the personal ornaments more plentifully) in Ireland, were partly imported from Gaul into these holy regions, the centre-point of the Druidical system,* and partly obtained from the stream-works of which traces exist in Cornwall, Devonshire (South Molton), the Carnarvon mines (recently reopened with some success, Vigra, &c.), the Lead Hills in Lanarkshire, the Wicklow districts, &c. Some of these localities were worked during the Middle Ages, and have ever since yielded mineralogical specimens of the ore to the explorer. The only metal exported from Britain in the time of Diodorus was tin, but gold, as well as silver, "*pretium victoriæ*," is enumerated amongst its productions half a century later by Tacitus ('*Agricola*, 12).

Greece Proper possessed no gold whatever as long as it was independent—the currency was exclusively of silver. The little gold the natives required for ornamental purposes they procured from Sardis. A tale is related by Theopompus ('*Ath.*' vi. 232), that the Lacedæmonians, requiring merely the small amount wanted for gilding the face of a bronze statue, sent all over Greece in vain in search of it, and at last in despair consulted the Delphic Oracle, which advised them to apply to Croesus. On account of this primitive poverty "this temple of Delphi was adorned with donaria in bronze—not statues, but caldrons and tripods made of bronze."

In the next generation Hiero, wishing to make a

* "Britain cultivates magic enthusiastically, and with so many rites and ceremonies that one would think she had taught it to the Persians." (Comparing the Druids to the Magi.) *Plin.* xxx. 4.

Victory and a tripod of fine gold for an offering there, after vain search at home sent agents into Greece, who came to Corinth, and discovered at last that Architeles, a Corinthian, had accumulated a considerable amount by purchasing gold coin little by little through a long space of time. This person sold them the amount required, and then gave into the bargain a handful of gold pieces. In return for this liberality Hiero sent him back a ship-load of corn and many other presents.

It is therefore to be concluded that at this time the Thasian mines were still in the hands of the Phœnicians,* who transmitted all their produce to Tyre. When, however, Philip had made himself master of the mines in Thrace, at Crenides and Scapte-Hyle, places under Mount Pangeus, which had belonged to the Thasians when Herodotus visited that island, he changed the name to Philippi, and prosecuted the works with great vigour and proportionate success, as appears from the extensive coinage of gold, which he was the first of the Greeks to put into circulation. These mines brought him in 1000 talents, or 60,000 pounds' weight of gold every year. They continued to be worked down to the end of the Macedonian kingdom. In the beginning of the reign of Perseus, Polybius notices that Abrobatis, a Thracian king, had got possession of them, but the Romans speedily expelled him. The first act of the latter on their conquest of Macedonia was to stop the works, only allowing the copper and the iron-mining to be prosecuted as before (*Liv. xlv. 29*). Inasmuch as this act is classed amongst their other benefactions to the vanquished, such as the grant of freedom, the reduction of the taxes to one-half—it would seem that the

* Pliny (*vii. 56*) records the ancient tradition that Cadmus, a Phœnician, first discovered gold-mines, and the art of smelting the ore, on Mount Pangeus, the locality in question.

later kings had carried on their mining operations by means of forced labour. Whatever the source, the wealth accumulated by the Macedonian princes was enormous. The treasure of the last of the line confiscated for the Roman Republic by Paulus Æmilius amounted to "ter millies," or above three millions sterling, which accession of wealth enabled the State to dispense thenceforth with taxing its citizens (Plin. xxxiii. 17): and it must be remembered the monarchy had, long ere this, been shorn of its foreign dependencies, reduced to its original limits, and drained by the long ruinous wars carried on by Philip, the father of Perseus, and by the latter also, chiefly by means of mercenaries.

To return to Philip: the metal for his coinage, besides the produce of the Thracian mines, doubtless represents much of those treasures of Delphi seen by Herodotus, but melted down by the tyrants Philomelus and his brothers to defray the expenses of the ten years' war they waged against the Amphictyons, whose general Philip was.

Diodorus (xvi. 56) states that Phaëllus, the last of the three brother-chiefs, *coined* into money the 120 ingots presented by Croesus, each ingot weighing two talents (120 lbs.), as well as 360 bowls of two minæ (2 lbs.) each: also the woman and the lion in gold, weighing together thirty talents. All this gold amounted in value to 4000 talents of silver (800,000*l.*), the whole of which went to pay his mercenary troops. The donaria in silver which the three "tyrants" melted down amounted to 60,000 talents. When all was spent they set to work to dig up the floor of the temple in search of hidden treasure, but were made to desist by an earthquake. The sums thus sacrilegiously obtained equalled the whole of the Persian treasure afterwards captured by Alexander. By a more wanton sacrilege one gave his wife Eriphyle's necklace (the

masterpiece of Vulcan, and the wedding-gift of Venus to Harmonia), dedicated by Alcæon; the other Helen's, the offering of Menelaus. The ladies drew lots for the choice: the proud and sulky one got the first, the beautiful and loose one Helen's ('Ath.' vi. 231). From the tithe of the spoils taken at Plateæ the confederate Greeks had made a gold tripod, supported on the triple-heads of a bronze serpent. Pausanias observes, "All the *bronze* part of the trophy was safe in my time, but the *gold* had fared otherwise with the Phocian leaders."

After Philip's restoration of the Temple the ancient votive pieces of plate continued to be replaced by fresh offerings of the same kind, and on the same magnificent scale. Upon the taking of Veii, Rome not possessing a sufficient quantity of gold to discharge the vow made by Camillus, the matrons spontaneously contributed all their jewelry, amounting to the weight of eight talents (about 500 pounds), out of which a single *crater* was fabricated, and found its way, after various mischances, to its destination. And when Sulla, hard pressed for money during the siege of Athens, obliged the Amphictyons to surrender all the Delphic treasures to his agent Caphis, one of the "old royal donaria" was a silver vase so immense that no single vehicle could be found strong enough to carry it, wherefore they were forced to chop it to pieces, and so forward it.* Sulla had, indeed, promised restitution of the value of the borrowed treasures both to Apollo and the Olympian Jove, similarly laid under contribution by him, and after his victory actually assigned for the purpose half the territorial revenue of the State of Thebes: but, from what

* These monster bowls, serving to hold the diluted wine for the enormous multitudes congregated at the great festivals, were the favourite form taken by national oblations; combining the utmost beauty with the highest intrinsic value. Paulus Æmilius, even in Rome's frugal days, made and dedicated to the Capitoline Jove one in gold, set with precious stones, weighing 10 talents (600 lbs.).

Pausanias says, his honest intentions were far from being carried out after his departure.

As there exist no coins of these Delphic tyrants (or rather patriots), or even of the State, in gold (and of that enormous amount of the metal some, if minted, would certainly have escaped the recoinage of the victors), it follows necessarily that they put the treasure into circulation in the form of small ingots, *ὀβελοί*, that, as tradition tells, primitive style of Hellenic currency, or like the earliest money of the Hindoos, bits of silver shaped like our dominoes, and having a punch-mark on one side only. We may be sure that Philip brought in a heavy bill of expenses to his employers, and that the bulk of the captured treasure found its way into his coffers.

His gold coinage must have been upon an enormous scale, considering the shortness of the period over which its issue extended, for even now his staters are as plentiful as those of his son, who had all the millions of the Persian darics to supply his mints. Similarly the gold pieces of Lysimachus, the next master of Thrace, are equally abundant, and testify to the continued productiveness of those mines. A recent visitor to that district informs me that the neighbourhood of Philippi is covered with huge mounds of refuse thrown up from the workings, which appeared to him much too recent to date from the times of the Macedonians;* yet there cannot be found any record of the mines having been reopened by the Byzantines.

Of Athens the few genuine gold pieces known are evidently copied, as regards their fabrique, from those of Philip, and in all probability were issued when the city was in the hands of Archelaus, the lieutenant of Mithridates. Aristophanes, indeed (Ran. 719), draws a contemp-

* As late as Valens, the *Thracian gold-miners*, driven to desperation by the weight of the imposts, joined Frigidian and his invading Goths. (Am. xxxi. 6.)

tuous comparison between the old-fashioned silver currency and "the new-fangled gold coin," the latter being, the scholiast tells us, the produce of the statues of Victory in the Acropolis melted down for that purpose the year before (a.c. 407): evidently a desperate expedient of the hard-pushed finance minister. But this issue, unpopular on many accounts (the poet notes among the rest its baseness), has totally vanished, leaving not one specimen behind, sharing the fate of that other contemporaneous expedient, the issue of a copper coinage, of whose summary *repudiation* by the State the same poet's fruitseller so ludicrously complains (Eccles. 817). There are also two or three small gold coins of a very archaic type ascribed to Thebes, but their paucity added to uncertain origin is such that their existence does not affect the question.

Philip's new gold coinage, the first that had appeared in Europe, obtained at once the most extensive circulation, owing to its purity and the vast convenience in trade of a representative of value universally received as perfect in standard and in weight. On these accounts it was distinguished by the title of the *Stater*. It is curious to find how even barbarous nations possessing gold, like the Gauls and some of the Illyrian chiefs, set about imitating these perfect works of the medallie art in rude pieces of their own. Philip's gold was issued almost entirely in the form of didrachms (133 grs. troy), evidently for the purpose of replacing the old Daric, which was of that weight. But his successors, the Ptolemies, the wealthiest princes of antiquity, having the richest commerce of the world superadded to their own productive gold mines, have perpetuated the memory of their opulence by the extensive mintage of the ambitious octodrachm, the quadruple of the stater, averaging 430 grs.

After, however, the wealth of Persia and the tributes of

the East had been made their own by the Macedonians, the old Thracian mines fell into neglect. They had been worked so long that it is probable they were nearly exhausted before Thrace fell under the power of the Romans, who fifty years earlier had taken from the Carthaginians the mines in the south of Spain, by far the most productive known to the ancient world. Of these, the mode of working them, and the reduction of the ore, Pliny has left the most exact details (xxiii. 21), so interesting to the metallurgist as to deserve to be translated in full.

"Gold is procured in our quarter of the globe (we need not trouble ourselves about the Indian that is stolen from the ants, or the Scythian from the gryphons) in three different ways. As *gold-dust* from river-beds, for instance from the Tagus in Spain, the Po in Italy, the Hebrus in Thrace, the Pactolus in Asia, the Ganges in India; and no other sort is so pure, inasmuch as it has been thoroughly cleansed by the transit and the friction. In the *second* way, as dug up out of deep shafts in mines, or as gathered out of the fragments of undermined hills. Both methods must be described. Those who 'prospect' for gold, first of all take a '*Segutillum*,' so the examination is called. This is a trough in which the sand is washed, and from what settles at the bottom a conjecture is formed: Occasionally by rare good luck the metal is found immediately on the surface, as lately in Dalmatia in Nero's reign, which produced as much as fifty pounds' weight per day: When it is thus found in the very turf they call it '*Talutatum*:' and also if the earth below be impregnated with gold: The dry and barren hills of Spain, on which nothing at all grows, are forced by this internal treasure to be productive. That which is extracted out of the shafts is called '*Canalicium*' or else '*Canaliense*:' it is incorporated with lumps of a white stone, but not in the same way as it

sparkles in the Lapis-lazuli, the Thebaic-stone, and in other gems, but in filaments embracing the particles of the quartz. These 'channels' of the veins run irregularly along the sides of the shafts, hence the name 'Canaliense.' The ground is kept up by wooden props. The ore got out is pounded, washed, roasted, then ground to dust. This powder the miners call 'Apitascudis,' the silver that is separated from it in the furnace they term its 'sweating.' The dross cast off by the fire, in all metals, has the name of Scoria. In gold-smelting this dross is again ground fine and melted. The crucibles are made out of 'Tasconium,' that is to say, of a white earth like pipe-clay, for no other would stand the fire, the blast, and the burning metal.

"The *third method* surpasses the fabled exploits of the giants. By driving adits to a vast distance they undermine the hills by the light of lamps. These lamps serve also to measure their spells of labour, and for many a month they do not see the light of day. This method they call 'Arrugia.' The ground over head often cracks, gives way, and buries the miners, so that it would seem a less dangerous task to seek the purple dye and the pearl from the bowels of the deep: so much more dangerous have we ourselves made the earth! They leave arches at narrow intervals to support the superincumbent mass. In both methods of mining they come upon a flinty rock: this they break through by means of fire and vinegar; but more frequently, as that makes the mine too stifling by the smoke and heat, they cut through it with iron crows weighing a hundredweight and a half each, and carry off the fragments of rock upon their shoulders, by night and by day through the dark, and hand them over to those stationed next; the furthest of all see the daylight. If the hard rock seems too extensive, the miner follows its side and works round

it; and yet mining in this hard rock is considered the easier of the two, for there is an earth made up of a kind of clay mixed with gravel (which they call 'gangadias*') that is almost impenetrable. This they attack with wedges of iron, and mallets of the same metal, and think nothing is so hard—were it not that the thirst for gold is of all things the very hardest. When the works are finished they cut through from below the supports of the arches. The coming fall gives warning, but that warning is only
 * intelligible to the look-out stationed upon the top of the hill itself. He, by shouting, by waving his hand, gives the signal to call out the miners, and at the same time flies down himself. The hill, crushed, falls in with a crash that cannot be conceived by human imagination, emitting a blast of wind of incredible violence. The successful miners view triumphantly the ruins of nature. Nevertheless the gold is not yet got, nor were they certain it existed there all the time they were excavating: a sufficient motive for all their risk and expense was the hope for what they desired.

“Now comes another task equal in difficulty, and of even greater expense. They conduct streams, in order to wash this wreck, along the mountain-ridges (an extra work), often from a distance of a hundred miles. This canal they call 'Corrugus,' probably a name derived from *convivatio*. Here also there are a thousand labours to be encountered. The inclination of the level must be steep, so that the water may be more truly said to rush than flow; and therefore they conduct it from the highest parts. The intervening valleys and ravines are bridged over by a watercourse in masonry; in other places impassable rocks are excavated, and forced to yield a support for hollowed trunks of trees conveying the water. The workman, as he cuts, is suspended by a

* *Gangue*, in French, is still used for the matrix of any mineral.

rope, so that to the distant view he presents the appearance not even of a wild beast, but merely of a bird on the wing. For the most part the engineer, too, is suspended similarly as he takes the levels and marks out the line for the canal; and where there is not even place for a man's foot to stand, rivers are led along by man's ingenuity. It spoils the washing if the stream bring any mud with it (that is, a sort of earth which they call 'Urium'), for which reason they conduct the water over rocks and pebbles, and avoid the 'Urium.' At the ends of the fall upon the slope of the hills they excavate reservoirs 200 feet square, and 10 deep. In these, five outlets, usually 3 feet square, are left: so that when the pond is filled, and the sluices are raised, the torrent rushes out with such force as to carry rocks away with it. Even now more work awaits them on the plain: trenches are cut for the stream to flow through, called 'Agogæ;' these are floored in steps with 'Ulex,' a plant like rosemary, but prickly, and fitted to retain the gold. The sides of these trenches are protected by planks, and the canals are carried on props over any chasms. So the rubbish, as it flows along, runs into the sea, and the fragments of the mountain are dissolved; and in this way Spain has extended her land far into the ocean by the earth washed down. The rubbish, drawn up with immense toil by the former method (sinking shafts), in order not to choke up the pits, is washed in this latter manner. The gold obtained by this process of 'Arrugia' does not require smelting, but is found native. In this way lumps are got (as also in the pits) above ten pounds in weight, which some call 'Palaga,' others 'Palacarna:' that which is small is called 'Balux.' The *ulex* itself is dried, then burnt, and the ashes washed, with a turf of grass laid under, so that the gold may deposit itself thereon.

"In this manner, according to some writers, 20,000

pounds weight of gold is annually obtained in Lusitania, Galicia, and Asturia; Asturia supplying the largest proportion. In no other part of the world has the same productiveness lasted during so many centuries.*

"We have already mentioned that gold-mining in Italy is prohibited by an old-standing decree of the Senate, else no country would have been more productive in *this* as it is in other riches. An ordinance of the Censors is extant, prohibiting the contractors from keeping above 5000 labourers employed in the gold-mines of Victumulæ, in the territory of Vercelli." This territory is now the Vallanzasca, where five mines have been worked, some with very large returns, from different periods in the last century. Although picked specimens from the Aquavite workings yield at the rate of 50½ oz. to the ton, yet the regular average of the richest of the five, the Peschiera, does not exceed the rate of three. These mines have just been taken and consolidated by an Anglo-Italian Company, which holds out to its shareholders the most flattering prospect (or, at any rate, *prospectus*) of enormous proceeds from the improved system of working proposed to be introduced.

Mining was prohibited as injurious to agriculture (which the Senate, and later the *good* Emperors, endeavoured to promote in Italy by all the means in their power), because it absorbed the labour that otherwise would have been employed upon the land. This prohibition extended to

* This Spanish gold was not of a very high standard, for Pliny observes that all native gold contains silver, sometimes to the extent of one-eighth the weight, sometimes one-tenth. But there was in Cal-læcia one mine, the Albacratense, that produced the best of all, having but one-thirtieth alloy. This last is certainly an unusual purity, for now the Californian has often more than one-twelfth of silver, being usually 20 carats fine; and even the finest Australian (Bendigo) never less than one-twenty-fourth.

all mines alike. Even the previously and still very productive copper-mines in Tuscany were not worked when Pliny wrote,* nor even the yet more tempting gold fields around Aquileia.

After the introduction of gold as the most important currency, by Philip, the art of refining it was brought to extraordinary perfection. This was maintained for an astonishing length of time, considering the difficulty of the operation, and the strong temptation to needy princes to tamper with the standard. An aureus of Vespasian, when assayed, was found to contain only $\frac{1}{12}$ of alloy; others about $\frac{1}{8}$: a native mixture which the most careful modern process could hardly eliminate. Even the wretched Byzantine emperors long resisted the temptation of debasing their aurei, and were satisfied at first with but a slight depreciation of their fineness. The bezants of the Comneni, in the eleventh century, are still of 22 carats, that is, hold one-twelfth alloy, the proportion allowed in the English sovereign, now the highest standard issued in Europe.

But after their recovery of Constantinople from the Franks (1261), the Palæologi debased the coinage to a degree never attempted, either before or since. Michael, the restorer of the Greek Empire, had previously, whilst reigning at Nicæa, minted bezants of only 16 carats, or two-thirds, fine gold; but his son Andronicus was so beggared, says Pachymer (vi. 8), by the enormous subsidies

* He mentions as a well-known fact (without his favourite qualification of "ut fertur" or "tradunt") a discovery that will puzzle our chemists. Caligula had succeeded in extracting gold out of *auripigmentum* (sulphuret of arsenic), but in such small proportion that the experiment was a losing one, although the mineral cost no more than four denarii the pound weight. The idea of acting on the transmutation of the baser metals as yet had not entered into any philosopher's head.

he had to pay to the Latins (his Genoese allies), that he reduced even this miserable quality to 10, and ultimately to 8 carats fine, so that the alloy actually equalled twice the weight of the gold: hence his bezants have now the appearance of mere brass gilt.

The Venetians, amongst the first in mediæval Europe to coin gold (their famous *zecchino* commencing in the year 1280), though they copied exactly the type of the contemporary bezant—the Saint presenting the *gonfalon* of sovereignty to the kneeling Doge—yet restored its standard to the utmost purity. So did the Florentines in their equally famous *fiorino d'oro*, issued a few years earlier (1252), taking its title from the fleur-de-lys, *la fiorenza*, rebus of the city's name, on the reverse; the type of the obverse being their patron the Baptist; the coin, "*la lega suggellata dal Battista*." The great Italian cities were to the last honourably jealous about the purity of their gold coinage. Dante finds Maestro Adamo plunged very low in the realms of torment for having forged florins containing merely 3 carats of alloy (the present French standard nearly), at the instigation of the Counts of Romagna, who thus made a profit of 12½ per cent. by the falsification. (Inf. xxx.)

"Ei m' indussero a batter i fiorini
Che avevan tre carati di mondiglia."

The honour of inaugurating the revived coinage of gold in Europe was very nearly falling to the share of England. Only five years after Florence, Henry III., evidently not influenced by her example, in his 41st year (A.D. 1257) issued his gold penny, of the weight of two sterlings (45 grs.), and to pass for twenty. The type, the king seated on a wide throne, holding the sceptre and orb, is unmistakeably an adaptation of the figure of the Saviour on the contemporary bezants of Nicæa. For elegance of

design, and even for neatness of workmanship, this beautiful piece stands pre-eminently at the head of the coins of the Middle Ages. It far surpasses, in both respects, the boasted Florentine novelty, although that, as report tells, was the invention of the great artist Giotto. But the English mintage of gold was no more than an experiment, unsuccessful it would seem, all the pieces having been called in, leaving but three survivors to declare its merit.

Our present standard, though *now* the highest used in Europe (on which account the Italian goldsmiths eagerly buy up our sovereigns to melt for their filigree-work, often at a higher rate than the course of exchange), dates strangely enough from the first attempt of Henry VIII. to tamper with the gold coinage; and this not before his 36th year, when he ventured to add 2 carats of alloy to the standard, ever before pure—a great national boast. Even his audacity advanced no further than the addition of 2 carats more in his last year, that time of bankruptcy. This last standard of 20 carats was used for the first mintage of his son; but in his second he restored the *fine* for his sovereigns and angels, retaining that of 22 for all his other pieces—a rule never subsequently altered. The sovereign (or 30-shilling piece) continued of fine gold until its extinction under James I., as did the angel down to its last appearance in the reign of his tasteful and unhappy successor.

No European nation can at present boast of a coinage in *fine* gold, though down to the close of the last century such was largely minted in the Venetian and Papal zecchins, and the Dutch and Austrian ducats. The credit of maintaining to the last this ancient glory of the mint rests, most fittingly, with Florence, and with its late worthy and much-to-be-pitied Grand Duke Leopoldo, whose *ruspone* (20-dollar piece), a magnificent coin, equalling in beauty

of execution its intrinsic purity, was issued, though sparingly, within my own recollection. No piece of equal importance with this has ever been minted as a *current coin* since the date of the Ptolemaic octodrachms. For the new-stamped "Kingdom of Italy," the French standard of one-tenth alloy (for both metals) has been adopted; and the same appears to be now uniformly employed in all the mints of the Continent, and likewise of America.

The *refining* and *assaying* of gold form the natural sequence to this notice of the "standard of purity." We have already learnt from Agatharchides' details how the old Egyptians refined the gold they obtained by quartz-crushing. This process, however, would only separate the baser metals, not the *silver* of the native alloy. How the Greeks and Romans subsequently contrived to obtain it so absolutely pure, still remains a problem. Unfortunately our grand authority Pliny fails us here, giving only a few incidental and scattered hints. Speaking of *misy* (crude arsenic), he alludes to its use in this process: "*hoc admiscet qui aurum purgant.*" Arsenic still enters into the composition of gold-solder to make it more fusible. In another place he notes that gold was refined by melting it along with lead, observing also elsewhere that alum serves the same purpose equally with lead. Again (xxiii. 22), he mentions the common employment of quicksilver for the same object, as the most effectual process of all, the pounded ore being immersed in the fluid, and shaken for a long time in an earthen pot, by which means "the gold was forced to vomit up all its impurities." To separate the quicksilver, the amalgam was put in a leather bag, when by pressure the former oozed through the pores of the leather, leaving the gold behind *pure*. And, in fact, this amalgamation would not take up the silver. Refining is now effected by *quartation*, an operation getting its name

from the addition of sufficient *silver* to the mass to constitute three-quarters of the weight. The mixed metal being immersed in nitric acid, the silver is attacked and dissolved into powder, the gold remaining intact in the form of a spongy mass. Mentioning its extreme infusibility, Pliny adds that the best material for melting gold (which resisted the hottest charcoal-fire) was *paleæ*, or straw that has been threshed—a strange fact, if correct, which he again adduces in his notice of the best materials for smelting the various metals (xxxiii. 30).

The process used for refining gold in the mint of Delhi in the middle of the sixteenth century, was as simple as the ancient Egyptian, and yet perfectly adequate to its purpose, as the purity of the magnificent coins thence issued convincingly declares. It is thus detailed in the 'Ayeen Akbary : '—“ The adulterated gold (*i. e.*, the collected pieces of different qualities) is made into plates of six or seven *mastaks* weight by the plate-maker. These he carries to the assay-master, who measures them in a mould made of copper; then he makes a stamp upon them. . . . When the above-mentioned plates have been stamped, the owner of the gold for the weight of every hundred gold mohurs must furnish four seers of saltpetre, and the like quantity of new brick-dust, which are to be used in the following manner:—The plates, after having been washed with water, are stratified with the above mixture, and the whole is covered with field cow-dung, which in the Hindostany language is called *onplah*. Then they set fire to it, and let it burn gently till the cow-dung is reduced to ashes, when they leave it to cool; then these ashes, being removed from the sides (of the plates), are preserved. In Persian this is called *khak khelass*, and in Hindostany *solony*; and, by a process which will be hereafter related, they recover silver from it.

"The plates then remain upon the ashes that are underneath them, and twice again are covered with cow-dung in the manner before directed, and these ashes also are preserved. When, after this manner, three fires have been applied, they call it *seetihy*. After that, the plates are again washed in clean water and stratified with the aforesaid mixture; which operation must be repeated till six stratifications and eighteen fires have been applied.

"Then the assay-master breaks one of the plates, and if there comes out a flat, dead sound, it is a sign of its being sufficiently pure; otherwise it must again be stratified with the mixture, and undergo three more fires. Then from each of the plates is taken one *maffah*, of which aggregate a plate is made and tried on the touch-stone. If it is not sufficiently pure, it is stratified once or twice more; but the desired effect is generally obtained by four stratifications."

The chemist will perceive that this simple though tedious operation produced exactly the same result as the modern process of quartation; it reduced all the silver alloy into a nitrate of silver, which was easily recovered by the process termed "kookerat;" whilst all the baser metals were expelled and converted into their oxides.

The *assaying* of gold was called *obruzza* or *obryza*, the etymology of which has been much disputed: although, in all likelihood, it is a Spanish or Punic word, like all the rest connected with gold-mining, and already quoted. In our own language an analogy presents itself in the same department; our mining terms come from the Germans brought over to instruct our people in such operations; hence such technical words as "sumf," "brattice," "shaft," "blende," "nickel," "cobalt," &c.

Obryza, from the "test," came to imply the standard itself; thus in the Byzantine Code (see Leo's 'Basiliæ,'

passim). ὀβρυζα is employed to designate the legal gold currency of the times, much in the same way as the word "sterling" at present.

This test or assay consisted merely in making the gold, whose quality was to be ascertained, red-hot in the fire, when, if the colour remained unchanged, its freedom from all alloy was established. For with the least admixture of copper, its colour was thus destroyed: our sovereign, though of such high quality, treated thus, becoming coated with a reddish-brown oxide of the baser metal. Some suppose this red-heating gave the name to the test: a derivation perhaps supported by Pliny's expressions: "Auri experimentum ignis est ut simili colore rubeat ignescatque, et ipsum obrussam vocant: primum autem bonitatis argumentum quam difficillime accendi." The last word, like "ignescere," signifies melting; for, fusing at so high a temperature as fine gold requires, a lambent flame plays upon the surface of the liquified metal. To this test Martial alludes, where, praising the fine quality of his golden *phiala*, he says (viii. 51),

"nec odit

Exploratores lurida maasa focos."

For this reason, "gold tried in the fire" is synonymous with "pure;" and the Byzantines called their aurei (even after they had lost all claim to the title) *ινέρπυροι*, "superior to the fire;" out of which word the Latins made the unrecognisable "perperi" their common name for the bezants. This same primitive test was preserved in Akbar's mint: "The skilful can discover from the colour with what the superficial part is alloyed, and by the file and punch is learnt the quality of the inside. They also try it by heating it in the fire, when, upon throwing it into water, blackness denotes lead; redness, copper; a whitish-

cinder colour, tin; and, according as it is more or less white, the greater or less is the proportion of silver."

From this assay the gold coins of the Lower Empire, after Constantine's reform of the currency, for many ages downwards, are marked in the exergue COM.OB, to indicate that their standard is the *obrysa*, or fine gold, which was indeed the truth for six centuries lower down than Constantine. The letters COM^a have not been satisfactorily explained: the final OB, however, admits of no doubt as to its purport, although a recent numismatic writer prefers construing them as the Greek numerals for 72, the actual number of the aurei that went to the pound Roman. But the use of *Greek* numerals in legends entirely Latin seems to me contrary to all analogy.

Our "Hall-Mark," so called because impressed at the Goldsmiths' Hall, is the stamp authenticating the fineness of the metal sold. It consists of four punch-marks, struck upon some inconspicuous part of the article, containing respectively the initials of the maker, the head of the reigning sovereign, the number of the carats *fine*, and a letter of the alphabet. The last is a relic of a clumsy and truly mediæval mode of declaring the date: twenty letters from A downwards complete a cycle of as many years, which ended, the same letters but of a different type, recommence a fresh cycle. By referring to the list of these letters (obtainable at the Hall) the date of any piece of plate can be ascertained as far back as the year 1696. But the custom dates from unknown antiquity. Until the present century no *gold* was allowed to be Hall-marked if of lower standard than 22 carats; then that of 18 (or one quarter alloy) was permitted, as being a quality best adapted for watch-cases, chains, and jewelry designed for rough wear. But some few years ago a Bill, inspired by the Birmingham interest, was struggled

through Parliament, the collective wisdom of the three kingdoms not being sufficiently practical to espy its true object, that of legalising the grossest fraud. By this Bill it was allowed to Hall-mark gold of 15, of 12, and (it sounds incredible) as base as 9 carats! mere *aurichalcum* or *billon*. This concession, wheedled out of ignorance by roguery, has fully answered the ends of its promoters; articles in this vile alloy, strongly gilt, are sold under the time-honoured prestige of the Hall-mark. Few purchasers are aware of the change in the law: the carats are marked, it is true, but the minute numerals are unobserved, or purposely obscured.

Our standard for silver (both coin and plate) from the Norman times down, has been very high, only 18 pennyweights alloy to the pound Troy, or less than one-thirteenth. Under William III. this standard was, for a few years, raised to quite *fine* for plate alone, probably with the view of preventing the melting down the coin for that purpose. Plate of this quality is stamped with a figure of Britannia in one of the punch-marks. But to the disgrace of our times, the Bill above mentioned also legalised a similar imposition upon the buyer (the exact extent however has escaped my memory) in the quality of silver plate, disguised by the proviso "for exportation."

The Romans had many *alloys* of gold, but all designated by distinct appellations, their "*aurum*" always standing for the refined metal. Thus gold containing as much as one-fifth of silver took the name of *Electrum*. Some was found native in the Spanish gold-washings, some was an artificial alloy. It was in request for drinking-vessels, partly because it was more lustrous by lamplight than the unalloyed metal, partly because the *native* kind was supposed to betray the presence of poison in the draught it contained by a changing colour and a crackling

noise.* The *Pyropus* was made by adding 6 scruples of gold (or one quarter) to the ounce of copper: the mass was beaten out into a leaf, apparently to be used for foiling gems; and seems to have been what is elsewhere described as *Aurichalcum* so employed. This alloy would produce a very red foil, which by the graduated application of heat can be made to take various and singular colours.

Pliny notices the great ductility of gold,† allowing a single ounce to be beaten out into 750 leaves, each 4 digits (3 inches) square, and even thinner. The stoutest sort was called the *Prænestine*, in consequence of having been employed for gilding the noted statue of *Fortuna* in that city: the second quality, the *Quæstorian*. It was also drawn into wire and woven into cloth entirely by itself. In a robe of such texture had Pliny himself beheld the *Empress Agrippina*, enthroned by the side of *Claudius*, at the show of the great Naval Fight which celebrated the opening of the emissary of the *Fucine Lake*. Some notion of the weight borne by the person distinguished by such a robe of honour may be deduced from what *Fauno* ('*Ant. di Roma*') tells of the vestments found (1544) in the sarcophagus of *Maria*, the betrothed bride of the Emperor *Honorius* (a child but six years old at the time of her decease): these robes of silk and gold thread yielded when melted down 40 pounds weight of the finest gold. The amount of the precious metal wasted by the Romans of the Decline

* Chinese porcelain, when first introduced into Europe by the Portuguese in the sixteenth century, was chiefly valued, says *Vossius*, for its supposed possession of the same quality, flying to pieces on the reception of a poisoned draught.

† Gold, by long hammering cold, assumes the hardness of iron, and has been proved the best of all materials for watch-wheels. The golden *acinaees*, the badge of the Persian satrap, may therefore have been designed for service, not for mere distinction.

for decorative purposes is curiously illustrated by a remark of Vopiscus. "Aurelian intended to prohibit the employment of gold in covering ceilings, or tunics, or leather, or silver; asserting that there was in reality more gold than silver 'in rerum natura,' but that gold was annihilated by its various uses in the form of leaf gold, of wire, and in a liquid state (*liquatio*), whereas silver was left to its proper purpose. He also gave permission that whoever pleased might have both dinner services and drinking vessels made of gold" (c. 47). The last was a wise expedient for fostering the accumulation of treasure in a shape not liable to any deterioration by wear, and that secured a fund within the houses of the wealthy of every class available in cases of emergency: constituting, as it were, a household bank.

Pliny gives recipes for the *solder* used by the goldsmiths of his time (xxxiii. 29). The chief ingredient was Chrysocola, or native verdigris (CHRYSOCOLLA). Theophrastus also speaks of the Chrysocola being used as a solder, but gives no further particulars as to the mode in which it was applied.

The Roman *gilder* stuck the leaf-gold upon marble by means of the white of egg; for wood he had a size, "Leucophorum," made of Sinope earth, Sil, and Melinum (also earths, red and white), mixed together and suffered to ferment for twelve days. This was applied as a *glue*, and therefore dissolved in boiling water.

In gilding copper, quicksilver was made use of, as at present; the surface having been rubbed with it, the leaf-gold was laid on, and the quicksilver then driven off by the application of heat. If the leaf was single, or too thin, the gilding looked pale, for which reason the workman, with a view to that mode of cheating, substituted for it the white of egg (the process now used by book-binders), which

doubtless stood the air very satisfactorily for a certain time, at all events sufficiently long to secure his payment. Pliny complains that mercury was then only used in gilding silver: for bronze-work, "which by law ought to be gilt by means of *argentum vivum*, or at least of *hydrargyrum*," a cheap and fraudulent substitute had been universally adopted, the particulars of which, however, are to me unintelligible. The bronze was made red-hot, then plunged in a pickle of salt, vinegar, and alum; it was now polished with sand, when its lustre proved if it were sufficiently purified. In this case it was slightly heated, and thus "tamed down" so as to receive the gold-leaf, which was fixed on it by means of a mixture of pumice, alum, and quicksilver. Perhaps the object was to economize the quicksilver, evidently an expensive article at that time (xxxiii. 20).

To understand the reason for these complaints, it must be borne in mind, as already stated under *Argentum*, that Pliny distinguishes the *Argentum Vivum*, the native quicksilver, found liquid and pure in the mines of other metals, from the *Hydrargyrum*, extracted by sublimation from the *Minium*, its sulphuret: although the metal is precisely the same in both cases. The greater rarity of Mercury in its native form * must have given rise to this notion as to its superior quality. The Romans obtained it from the Spanish silver-mines: and still Almaden is one of the two chief sources, Idria in Carniola being the other.

Statues made entirely of gold seem to have been peculiarly an Oriental invention. Herodotus, and after him Diodorus, have left accounts of idols of the kind, formerly standing in Babylon, and of a weight evidently largely exaggerated by tradition: for the iconoclastic *Persians* had

* "*Et alias Argentum vivum non largum inventum est.*"

melted them down for the greater part, even before the most ancient of historians visited that old capital. Nevertheless, he actually saw in a shrine, at the base of the Temple of Belus, the seated figure of the god, which, with his table, throne, and footstool, the Chaldeans informed him, weighed 800 talents (48,000 lbs.). Another statue, carried off by Xerxes, had been that of a *man* (*ἀνδρας*), 12 cubits high, and *solid*. This must have been the statue of the royal founder of the Temple; its *solidity*, however, may well be put down to the account of the Grecian traveller's guide. These gigantic figures, as the authentic account of the construction of similar works—the cherubim lining the Jewish sanctuary—informs us, were carved out of cedar-wood, and then overlaid with gold in plates necessarily slight, to admit of being moulded over the carving underneath.

But the celebrated idol of Anaitis (Venus), made out of *solid* gold, “long before bronze had come into fashion for such uses,” remained in her temple at Anaitica, on the Euphrates, until the shrine was despoiled by Antony's soldiers upon his Parthian expedition. Augustus, chancing to dine with an old soldier of Antony's at Bologna, inquired if it were true, as commonly reported, that the first man who laid hands on the goddess was immediately struck dead; and received for answer that his entertainer was the very soldier in question; that Augustus himself was then dining off a leg of the idol (converted into a dish, it would seem), and that his whole fortune consisted in that very piece of plunder.

Of the Greeks, however, the colossal chryselephantine statues, in which art vied with material, required but a comparatively small weight of the precious metal; in fact, Pausanias (i. 40) notices an instance where the entire

trunk was made up of clay and gypsum. Chryselephantine decoration was, however, applied by the Greeks of more opulent times to the woodwork of their temples with a lavishness utterly beyond all modern conception. The great doors of the Pallas of Syracuse were of ivory, all their bosses and nails being of gold. Their crowning glory was the "*Gorgonis os pulcherrimum vinctum anguibus*," which that "terrible amateur" Verres tore off and carried away, as Cicero tells us (Ver. iv. 56).

The first of the Greeks to have a statue in gold was the arrogant sophist Gorgias, who dedicated at Delphi a *solid* one of himself. But this, considering the rarity of the metal in Greece* at that period—the 70th Olympiad—was doubtless no more than a diminutive statuette. The kings of the East, however, continued to emulate their Babylonian predecessors; for Plutarch mentions, as carried in the triumphal procession of Lucullus, a solid figure of Mithridates in gold, six feet high. Taking the weight of a living man of this stature at 150 pounds, the relative specific gravity of gold in the same bulk would give a weight of 3000 pounds to the figure, equal in value to 135,000*l.*: a large sum, in truth, yet not beyond the flight of the vanity of an Asiatic conqueror of the wealthiest regions of the ancient world. Works of the same character and of the same enormous value continued to be made for the embellishment of temples under the Roman Empire. Thus we find Priscilla, the wife of Abascantius (and he merely an "*agens in rebus*," answering to our "King's

* Long after this date, when Philip though the richest prince in that country, first became possessed of a gold cup, he valued it so highly as to keep it always under his pillow at night: a sufficient proof of the scarcity of such objects there before the conquest of Persia. The rare Greek reliefs in gold that have come down to us are beaten out in plates of the utmost tenuity, as we have seen already (*ORFÈVRES*).

messenger"), directing by her testament her heirs to dedicate in the Capitol a portrait of Domitian, which should weigh 100 pounds of gold:—

"Da Capitolinis æternum sedibus aurum
Quo niteat sacri centena pondere vultus
Cæsaris, et propriæ signet cultricis amorem."

Stat. Syl. V. i. 190.

This must have been a votive clypeus, embossed with the imperial bust in high relief, like the "very magnificent" one Antoninus subsequently put up in honour of Hadrian. If a subordinate could offer pieces of this costliness; some notion may be formed of the surpassing magnitude of those coming from the superstition or vanity of noble and imperial votaries. These donations to the temples augmented rather than declined in amount down to the very eve of the downfall of this time-honoured worship. Aurelian consecrated in one single temple (doubtless that of his patron, the Sun) no less than 15,000 pounds' weight of gold; besides large quantities, not specified, in the other shrines of Rome. This liberality of his is highly commended in an eulogium upon him, beyond all suspicion of flattery, for it was pronounced, upon the first intelligence of his death, by the *Princeps Senatus*. The nature of these truly *precious* memorials may be gathered from many incidental notices in the historians of the Lower Empire. To Claudius Gothicus, besides the column and statue in silver already mentioned, the Senate erected a Colossus in gold ten feet high, still standing when Treb. Pollio wrote. To his successor Aurelian they decreed, upon the news of his murder, a statue in gold, to be placed in the Capitol; besides three in silver, for the Senate-house, the Temple of the Sun, and Trajan's Forum. Vopiscus notes ('Tacitus,' ix.) that the one in gold was never made, but the three in silver were. It may be concluded

that these figures were all of life size; for, had they exceeded it, that careful historian would have mentioned the circumstance.

The anecdote concerning Antony's veteran above cited, recalls the fact that, at a late period of the Empire, the vanity of the rich loved to exhibit itself in gold plate for the table, made on the same enormous scale as that of the later times of the Republic had been in silver. As an example, in the fifth century Aëtius presented a "missorium" of the weight of 500 pounds of gold, enriched with precious stones, of exquisite workmanship, to Torismund, king of the Goths. By the promise of this same missorium, Sisemund, an aspirant to the Spanish throne, in 631 purchased the alliance of King Dagobert, and redeemed the pledge by the inadequate payment of 200,000 aurei, a sum expended by the Frankish monarch in founding the Abbey of St. Denys. The King of the Burgundians, Gontron, tells the assembled Gallican bishops, showing them at the same time a large gold basin, that, having captured the plate of the Roman prefect, Mumulus, he had only retained for himself one dish, weighing 150 pounds, together with this basin, and had ordered *fifteen* others of the same size accompanying it, to be melted down, having himself no use for them.

Another mode in which a great amount of gold was used up by the later Romans was in imitation of the Persian fashion, the wearing of *χρυσόεσσωτα*, robes entirely covered with disks of the metal adorned with stamped-up patterns. Of these embossed decorations, or *rosettes*, many are still preserved. The substance of the plate being usually of the thickness of cartridge-paper, the entire weight going to the ornamentation of a single robe must have been very considerable. In the imperial mantle, as figured upon the bezants, each disk appears in the centre of a square

compartment formed by pearls, the whole being stitched upon stout purple silk. In the tomb of some Gothic chief, lately discovered at Hallstadt in Styria, lay the remains of such a vesture in the shape of innumerable disks, the size of a silver penny, each perforated, which, when sewed together, must have formed a complete coat of gold. Under the Lower Empire, and notably in the reign of Constantius II., the Roman mints issued an incredible quantity of gold in medallions of large superficial extent (some being two inches in diameter), but of comparatively small thickness. The execution of their types is very careful, though the drawing betrays the influence of the Decline, and their reverses commemorate the triumphs (real or imaginary) of the emperor. These pieces were mounted in filagree frames, and worn like our "orders" by the military. There is reason to believe that these ornaments were the "*stellaturæ*," in the name of which the tribunes (colonels) used to exact heavy fees from their men: an abuse capitally punished by the great reformer, Sev. Alexander. (Lamprid. 14).

Gold was esteemed a powerful amulet: infants were therefore touched with it in order to baffle the influence of witchcraft; wounds also, with the view of promoting their healing. Of this notion traces yet remain in the sacred custom with old nurses of putting a piece of the metal in the hand of the new-born babe "for the sake of luck;" and also of rubbing sties on the eyelids with a wedding-ring. Nevertheless, if it were held over fowls or sheep, it prevented them from breeding, until the gold was rinsed in water and the animals sprinkled therewith. Roasted in an earthen-pot together with salt and vitriol, and a second time with salt and schistos (alum), the gold communicated, though itself unchanged, a specific virtue

to the powder that rendered it a sovereign remedy for malignant ulcers, and for the piles.

ANCIENT BRITISH COINAGE.

It has ever been a question with numismatists whether the Britons possessed a national coinage at the time of Cæsar's invasion. The French writers, headed by Mionnet, ever seeking for a sly blow at "perfidious Albion," boldly claim every pennyweight of Celtic coinage turned up in our soil as an importation from some Gallic mint—pretensions which are met with patriotic indignation by the antiquaries of this side of the Channel. By a strange coincidence both parties quote the passage in which Cæsar mentions the money of the Britons: the one to prove that they *had*, the other that they had not, a coined money at the time when he was writing.

This singular discrepancy in their deductions arises from the simple fact of neither side having observed that Cæsar, in his description of Britain, divides the inhabitants into two classes—colonists and aborigines. The former, whom he describes first, were the *Belgæ* who had passed over from Gaul at different times and with various objects, and had occupied the whole of the coast, retaining however the names of the states from which they had emigrated (v. 12). How far this occupation had been pushed appears from the incidental remark, that "within the memory of people then living, Divitiacus, king of the Suessones (*Belgæ*), had been lord of all Britain" (ii. 4). Those settled in the province of Cantium, and by far the most civilized of the inhabitants, are noticed as differing very slightly from the Gauls on the mainland in their manners and customs. Now we know that the Gauls had

possessed, for perhaps two centuries before this date, an immense gold coinage of their own. As the colonists retained their ancient culture, such as it was, it follows almost necessarily that they kept up the practice of striking coins. They would imitate the types of their national coinage, but more rudely until, by the successive copying of copies, they degenerated into those barbarous designs so far removed from the prototype of all (the Philippus) as to become altogether enigmatical. That these colonists had a coinage of their own is almost involved in the fact of the declared identity of their civilization with that of their parent states.

In the second place, Cæsar proceeds to describe the aborigines, the "*nati in insula*," according to their own tradition; the natural offspring of the land. These, from his picture of them, were complete wild men of the woods, driven far into the interior by the Belgic invaders. As might well be expected, such savages had no coinage at all; of the precious metals they knew nothing; their poor representatives of value were carried about them in the shape of personal ornaments. Cæsar's actual words upon this point are (as the acute Pinkerton has well seen) those to be found in the *editio princeps* of his *Commentaries* (Roma, 1469)—a passage later so preposterously disfigured by the emendations of over-learned editors, in order to adapt it to their own preconceived ideas. It stands thus:—"Utuntur tamen ære ut nummo aureo, aut annulis ferreis ad certum pondus examinatis pro nummo." Now had these native Britons, like the Gauls, possessed a regular coinage, Cæsar would not certainly have thought such an ordinary usage a thing worthy to be enumerated amongst the *peculiarities* of this newly-discovered race, especially as the rest of his list consists of manners and customs the most diverse imaginable from those of the rest of the

world. It is therefore evident that he was struck with this their strange substitute for a circulating medium, and deemed it especially worthy of mention.

The estimation of the constituents of this currency coincide with the relative value of the two metals amongst the aborigines—the copper taking the place of gold, the iron of silver; for Cæsar has just before stated that all the copper they used was imported, whereas iron they had, though only in small quantities, upon the sea-coast (doubtless alluding to the old Sussex mines). Metal in thick wire, bent up into rings of a fixed weight, was perhaps the very earliest form of currency in the world. The ancient Egyptians knew no other, and to this day it is universal (for copper and gold) with the tribes on the Guinea coast.* Such a form is recommended by its portability on the fingers, or of several linked together into a chain, besides the convenient shape of the piece of metal for conversion into other uses.

The above view is corroborated by the fact that no British coins exist that can be attributed to the natives beyond the limits of Belgic influence. None are ever discovered in the region occupied by the Silures, that powerful tribe which maintained its independence the latest of all, nor in the country of the Ordovices, though actually abounding in gold; neither anywhere to the north of the Solway, though so long the seat of an independent British kingdom.

A few years after Cæsar's landing, Cunobelinus, a king of the Iceni, the Belgæ of the east coast, having acquired some little tincture of Roman education, gave up the old

* Large quantities of brass are annually exported from Birmingham to Africa, cast into the shape of wide penannular rings called *manillas*, exact counterparts of the smaller Celtic torcs, and often passing current for such with indiscriminating antiquaries.

Greco-barbarian type of the coinage, and endeavoured to imitate that of his patron Augustus, both in design and in make, precisely as his countrymen upon the Continent were, a little earlier, rudely copying the consular denarii. It may be supposed that the chiefs of the other maritime tribes followed his example, and issued the numerous caricatures of the Roman mintage found in other parts of England, pieces in base silver and copper, struck in the Roman style, flat, not like the Greek, *dished* upon one side. That such a coinage was actually carried on here, until the real subjugation of the island in Nero's reign, is established by a passage in Gildas (§ 7), recording that after some great rebellion of the natives (apparently the one under Boadicea), the Romans changed the name "Britannia" into "Insula Romana;" and ordained that all the metals it possessed should be stamped with Cæsar's image: "et quidquid haberi potuisset æris argenti vel auri imagine Cæsaris notaretur."

THE ROMAN STANDARD OF CURRENCY.

Pliny expresses his surprise that the Republic should have exacted the tribute from all the subject nations in *silver*, instead of in gold as was the rule in his times. He did not pay attention to the fact that under the Republic the standard of currency was silver, and that all payments were estimated in that medium. There had indeed been a coinage of gold, commencing about 200 B.C., but to a very limited extent, and apparently not so much intended for commercial as for religious purposes, for distribution in prizes, or for offerings to certain deities under specified conditions. These coins were extremely minute, weighing one scruple, Roman (18 gr. Troy), and current for 20 sesterterii, the value XX being marked on the obverse. Doubles

and Triples of these are also extant, but the whole series ranks amongst the rarest of the rare. In fact, the republican gold currency was almost as restricted in extent as that of Athens. But in the last half-century of the Republic it was considerably augmented, Julius Cæsar, and the heads of the opposite party (more particularly in the Civil Wars following his death), coining pretty largely gold didrachms of the weight of the gold Philippus, then the universal currency of the civilised world. But under the Empire the whole monetary system was changed: gold became the standard, a matter of necessity in a condition of wealth (as it had been before under the Persian Empire); silver was only issued to the amount required for necessary small change, and by some of the first Cæsars hardly at all, *e. gr.*, in the reigns between Tiberius and Vespasian. Of some of these emperors, as Claudius and Nero, more gold pieces than silver are actually now extant. Under the latter the issue of gold and bronze, beautiful pieces in point of execution, was enormous,* yet his denarii are most carelessly made and rare; of Claudius one may venture to say no genuine silver exists; all now seen in cabinets being plated pieces, and due to ancient forgers, or if in solid silver to their modern brethren.

Gold therefore being now the standard, the taxes were all estimated in that metal, every *caput* being assessed at so many aurei. Of this regulation certain tyrants took advantage, like Heliogabalus, who, coining aurei of ten or more in weight, even up to 100 (bilibres), exacted the same number of aurei as before from the payer, whilst he decupled or centupled the actual amount. Sev. Alexander, acting conversely upon the same principle, retained

* In fact, so largely did it exceed the collective bronze coinage of all his predecessors, that Martial uses "*Neroniana massa*" as synonymous with the money-changers' stock of small coin, or "coppers."

the nominal amount of the assessment, whilst he reduced the real burthen upon the taxpayer by striking first halves,* and afterwards thirds of the aureus; and intending, if possible, to issue quarters (a thing found impracticable), thus making the *caput*, who had in the previous reign paid in one aureus the value of ten, by this singular expedient for lowering the tax, now pay but one-thirtieth of that amount. To obviate similar injustice it was afterwards specified in the ordinances that the payment was to be made in aurei of so many to the ounce,† of which, when Julian was Cæsar in Gaul,‡ Ammian mentions incidentally six went to the ounce, the regular weight of the aureus after Constantine's regulation, and of the succeeding Bezan, down to the end of the Empire. Yet long after Julian's time the publicani had revived the old method of extorting more than their due from the oppressed provincials, for Majorian in an edict reprobates their exacting payment in the gold of the Antonines, thereby raising the tax nearly 50 per cent., for this coinage was to that of the Lower Empire as 110 to 72, and orders that no aureus, if of full weight, should be refused in payment of the tribute, "except the base *Galic* one," i.e. the autonomous Celtic.

That from the beginning of the Imperial régime the taxes had been paid in gold, and no longer in silver, appears from the anecdote told by Suetonius of Caligula, that, wishing to view the tangible income of the state, he

* First coined by him, according to Lampridius; before this the aureus had no subdivisions. It is evident, therefore, how by augmenting the weight of the piece, the emperor was enabled to raise the assessment of each *caput* in whatever proportion he chose.

† There are bronze weights extant of the reign of Arcadius and Honorius, inscribed EXAGIVM SOLIDI, i.e. the legal weight of the gold coin as it was to be received by the tax-gatherer.

‡ By his good management he reduced the *caput* from 25 to 7 solidi.

caused all the *tributa* of the year to be poured on the floor in one room, and, stripping himself naked, wallowed "super immensos aureorum acervos," and literally bathed in gold; a freak befitting an imperial lunatic, and a fancy full of a certain insane magnificence. From this time, too, we find all the legal fines estimated in aurei, at first simply named as such; but when pieces of different weight came to be in circulation together, the assessments are made in ounces or pounds of gold. The ancient method of reckoning by *Sestertia* was retained by the historians, who affected the antiquated mode of expression, and perhaps to a certain extent in ordinary life, for it happened to be convenient enough, a *Sestertium* (1000 nummi) being exactly ten aurei. In fact, this old way of reckoning had now a more tangible representative existing in the currency than before, for the *Sestertius* (or *Nummus*), the unit, was issued in abundance by the Cæsars following Tiberius, being what numismatists call the First Brass, whereas, under the Republic, it may be said to have been only a money of account, the few sestertii coined in silver being rare to an excess. * Even this custom expired in the interval between Suetonius and the writers of the Augustan History (who flourished under Diocletian and Constantine),* for, in their reckonings of sums, the "*Antoniniani*" and "*Philippeii*," are counted by tale, and the silver by weight. But theorists unacquainted with this fact attempt by long and intricate calculations to give the value of the *Sestertium*, "*HS.*" in the terms of the silver standard, long

* Lampridius, who compiled his biographies for the information of Constantine, furnishes a striking instance of how completely, by the beginning of the fourth century, the former calculation by sestertia had become forgotten and out of use. Mentioning that Heliogabalus (24) never spent less on a dinner than "*centum sestertia*" (1000*l.*), he explains this sum as equal to 80 lbs. weight of silver, whereas the true value is 300 lbs.

before become obsolete. The sole true method for estimating the actual amount of sums stated by the historians of the Empire, is to compare the weight of the aureus with that (intrinsic) of the modern gold, and it will be found that for the times of the Caesars, and even down to Severus, the former was equivalent to our sovereign. And by a more singular coincidence it will be discovered, on investigating the prices of the necessities of life at the same period, that the value of money was by no means higher then than in our own times.

The wealth of the later Romans, visible and tangible be it remembered, far exceeded the nominal wealth of our Rothschilds, existing merely in paper and in credit. M. Crassus, observes Pliny, had engrossed for all succeeding times the title of "the Rich," and yet the historian had known several surpassing him in that particular, especially three at one and the same time, the freedmen and ministers of Claudius—Callistus, Pallas, and Narcissus. And yet this Crassus possessed landed property alone to the value of two millions sterling (his millies), and was used to give for his definition of a rich man one that could afford to maintain a legion out of his yearly income. The amount he intended is easily calculated. The pay of the private was a denarius per day, making 14*l.* 10*s.* per year. Now, putting a legion at its full complement of 6000 men (which in his times it never attained), so as to cover the excess of the pay of the officers, the ready money required for the pay alone is 87,000*l.*; to which must be added the cost of feeding them, which also was supplied by the state. A view of their general wealth may be gained from the will of one Cl. Cæcilius Isidorus, made *a.c.* 8, and quoted by Pliny (*xxxiii.* 52). Though the testator complains of immense losses sustained in the recent civil war, he was yet able to leave 4116 slaves, 8600

yoke of oxen, 257,000 head of small cattle, and in ready money *sarcinies*, or 600,000*l.*, and to fix the expense of his funeral at 11,000*l.* The succeeding times doubtless afforded many similar examples, for only a few years after the disastrous reign of Gallienus, a time of national bankruptcy, we find the Emperor Tacitus (A.D. 279), who had made his money by trade, chiefly as a timber-merchant, possessing landed property valued at two millions eight hundred thousand pounds, and which, like the equally unlucky Louis Philippe, of our memory, he made over to the state. With his ready money he kept on foot the entire standing army during the six months his reign lasted.*

* As a necessary consequence of this abundance of money, living was as dear in ancient Rome as in modern London. To give a few examples from three different centuries. Sulla, in the days of his obscurity, rented one floor of a house, unfurnished, at 3000 nummi (30*l.*) a-year: a freedman, his friend, the one above at 2000. Martial gives us to understand that a genteel house (not a palace) sold for *ducenta* H. S. (200*l.*); that the cheapest of dinners could not be got under 8 nummi (20*d.*), and that "literary men" were forced to live in garrets:

"Scalls atque habito tribus sed altis."

Great complaint was made to Sev. Alexander that the price of meat had risen to 8 minuti (2*s.*) the pound; he by wise regulations caused it to fall to one quarter of that sum. The tariff of Dioclesian's edict, above quoted, is compared by Waddington to present Parisian prices.



CARBUNCULUS: "Ανθραξ: *Ruby*, and *Garnet*.

THE modern name for this stone, *Ruby*, *Rubino*, is merely an epithet expressive of its distinctive colour, as being the *Red* variety of the *Hyacinthus*. For, one of the inexplicable chemical enigmas of Nature, the *Ruby* and the *Sapphire*, though differing so greatly in appearance, are chemically the same substance, pure *Alumina*. For the same reason *Marbodius* calls this division of the *Hyacinthus* "*Granaticus*," from its resemblance in tint to the crimson juice of the pomegranate.

The *Ruby* was the first "Ανθραξ of *Theophrastus* (18), a name signifying a live coal, because "it was blood red in colour (*ερυθρός*); but if held up against the sun, assumed the appearance of a burning piece of charcoal." He terms it "very valuable, inasmuch that a small ring-stone used to sell for 40 gold staters (40 guineas)," a statement which could hardly apply, in his age of high civilization and extended commerce, to our *Garnet* or *Carbuncle*, a common stone, and produced abundantly in many parts of Europe. The true *Ruby* must likewise be included amongst the numerous species of the *Carbunculus* described by *Pliny* (xxxvii. 25), though, as *De Laet* has justly observed (i. 2), there can be no doubt that he classed under that generic name every kind of red, transparent, fiery stone: the *Pyrope*, the *Almandine*, and the *Red Jacinth*, equally with our *Ruby*. One of the qualities, however, which *Pliny* assigns to his *Carbunculi*, that of not being affected by the

fire, whence they were called "Acausti," applies exclusively to the Ruby. For whilst the Garnet easily fuses into a dark globule of oxide of iron (and in some Swedish mines constitutes, in its coarsest form, an appreciable proportion of the ore smelted), Henckel relates an experiment in which a Ruby was sufficiently softened by means of a powerful burning-glass to receive the impression from a Jasper intaglio, without the slightest detriment to its original colour or hardness on its cooling.

The same conclusion may be deduced from the brief notice in Theophrastus, who particularises, amongst the "polygonal" ones found in the neighbourhood of Miletus, some having "six" angles. Now the numerous angles of the common Garnet, a rhombic dodecahedron, form its most distinguishing feature; whilst the Spinel Ruby is a perfect octahedron, and therefore presents but six angles: and the exactness of its singular form would naturally fix the attention of the early mineralogist. Pliny gives the first place to the Carbunculi Amethystizontes, "in which the extreme blaze goes out in the purple of the Amethyst." These may have been our Almandines, as well as our purple Spinels, for the difference between the two is hardly to be appreciated by the eye alone.

But the true Ruby and its two inferior varieties can with greater certainty be referred to that class of the Carbunculi described separately by Pliny as the *Lychnis*. His *Lychnis* belonged to the same family of fiery stones as the Carbunculus, was of pre-eminent beauty, and derived its name from its property either of lighting up lamps, or of lighting up itself by lamplight (a lucernarum accensu). The former explanation of his meaning is supported by Orpheus, saying of his *Lychnis* (Αἰθήρα, 270), "from off the altars, thou, like the Crystal, dost send forth a flame without the aid of fire;" but Solinus, as we

shall see immediately, understood it in the latter more prosaic sense. Perhaps, after all, Pliny's expression meant no more than lamp-like blaze, for Dionysius has to that effect—

. . . λυχνίς πυρός φλογὶ πάμπαν ὁμοίη.

It was produced in Orthosia, as well as all over Caria and the neighbouring regions; but that most esteemed came from India.* “which last some have termed a Carbuncle of milder tint.” The second in rank was the Ionia, so called from its resemblance to the flower of the same name (the Greek *Ἴον*, or Red Cyclamen). “And between these last I find a difference noticed, one kind having a purple lustre, the other a red (*cocco*, *kermes*). Warmed in the sunshine, or by friction with the fingers, they attract straws and scraps of paper.”† The description of the same stone given by Solinus is, according to his custom, much more definite than the above, and more that of the practical gem-dealer. He calls the species “*Lychnites*,” because these stones shine most by lamp-light; “it is both of a transparent purple and of a light red, and attracts bits of thread, straws, &c., when rubbed, or heated in the sun. It is very difficult to engrave, and *then* pulls away the wax as though by the bite of a living creature, ‘*velut quodam*

* The Greeks carefully distinguish the first class amongst the *Ἀνθαί* species by the epithet of “Indian.” Thus the Golden Vine, beneath which the King of Persia used to sit in state, had bunches of grapes in Emeralds, in “Indian Carbuncles,” and in all kinds of other gems exceeding in value (*Ath.* xii. 539). There can be no dispute, however, that little, if any, distinction was then made between the fine Sirian Garnets, the Spinel, and the Ruby.

† The Carthaginian Carbunculus (xxxvii. 90), though of less value than the *Lychnis*, was said also to exhibit this electric property; another argument that the *Ἀνθαί* of Theophrastus, “brought from Carthage,” was a true Ruby. The native Garnet cannot be rendered electric by any amount of friction, but can when *faceted*.

animalis morsu.” Now all these qualities can be found combined in no other stone but the Ruby. The best still come from India (Siam and Ceylon), though inferior ones are sometimes found in Bohemia (of which more anon). The true Ruby burns with the redness of the alchermes dye; the Balais is of the same tint, only diluted into a faint rose, or a lilac; the Spinel, of pure red, or of crimson tinged with blue, or with brown counterfeiting the orange of the Jacinth.* In hardness they are only surpassed by the Diamond and the Sapphire; in fact, none but Oriental artists have attempted to engrave upon them in modern times. But the character noted by both these ancient mineralogists, which decides the question beyond all cavil, is their remarkable electricity. I have ascertained by actual experiment (and seem to have been the first to make the discovery) that both the Spinel and the Balais (native) possess this property in the highest degree; to the same extent indeed as the Sapphire or Brazilian Topaz. That early author Erasmus Stella (1517) interprets *Lychnites* by Almandine; but the latter, a more species of the Garnet, is non-electric before it has received a “vitreous polish” from art, a fact which entirely excludes it from the descriptions of Pliny and Solinus. Haüy, however, points out one infallible test for distinguishing the Ruby from the Garnet in all their respective varieties. The latter, however pure and lustrous, if held so as to reflect the light directly, appears black and opaque, the former similarly examined retains its transparency and true colour.

It is curious that the name *Spinel* should be merely an equivalent of *Carbunculus*, being a diminutive of *Σπινος*,

* Some Spinels are bright cherry, which again tinged with yellow gives a pale cinnamon; a rare variety is a deep violet; and lastly, a white Spinel comes from Brazil mixed with Diamonds.

σπινθηρ, a spark. Theophrastus (13) describes by this name a mineral found at Binæ, in the copper-mines, which broken to pieces and piled up in the sun ignites spontaneously, the more readily if sprinkled with water; but this must, from the last peculiarity, have been Iron Pyrites.

"Balais" is foolishly explained by De Boot as a corruption of *Palatium*, as being the "abode" or matrix of the true Ruby, according to the doctrine of his day, that every Precious Stone was produced in a matrix consisting of an inferior variety of the same subject-matter. But De Laet comes nearer the mark in quoting Marco Polo's notice of a mountain, *Ballakeia*, in India, supplying this stone and giving it the appellation. The old French designation "Rubin de Balais," further confirms this. *Ballen*, "king," was the Phrygian name for a certain fiery stone: perhaps this, after all, is the true etymology of the word. And to conclude, Chardin gives the true source as *Balachani*, "the stone of Balachan" (Pegu), the Persian name for the Ruby.

Another argument, perhaps of some weight, as founded on old tradition, in support of the identity of the Balais with one kind of the Lychnis, is that Camillo ascribes the same supernatural virtues in averting hail and tempests to the Balais, which Orpheus has given to his Lychnis.

The only Rubies fit for the jeweller's purpose are brought from Siam, whose king assumes the style of "Lord of Rubies," and does his best to preserve the title by making the mines a royal monopoly, and strictly prohibiting the exportation of all the fine specimens that come to light. This is the true cause of the extreme rarity of large Rubies in Europe. But ill-coloured, flawed stones abound in every quarter of the globe; in America, occurring in large, opaque crystals; in Ceylon, in small rounded masses in company with Sapphires in the river

gravel; in Australia, where the diggers meet with them by the thousand in the gold-washings, and giving them the name of Garnets, take no further heed of them. Yet this last region will probably soon rival Pegu when the *placers* come to be examined by experienced eyes, for it is said on good authority that a few Rubies of very fair quality have already found their way from Australia into the London market.

It is a certain, though utterly inexplicable fact, that all precious stones produced in Europe, fall infinitely short both in tint and in lustre of their congeners matured by the sun of the tropics, although chemistry can detect no difference in the constituents of the two classes. Nevertheless Tavernier, a jeweller of the widest experience, talks of Rubies discovered in his time in Bohemia, that could not be distinguished from those of Pegu, and tells thereanent the following remarkable anecdote, which I transcribe as best given in his own words:—"Je me souviens qu'estant un jour à Prague avec le Vice-Roy de Hongrie à qui j'étois, comme il lavoit avec le Général Wallenstein, Duc de Friedland, pour se mettre à table, il vit à la main de ce Général un Rubi dont il loua la bonté. Mais il l'admira bien plus quand Wallenstein lui dit que la mine de ces pierres estoit en Bohême; et de fait au départ du Vice-Roy il lui fit présent d'environ une centaine de ces cailloux dans une corbeille. Quand nous fûmes de retour en Hongrie, le Vice-Roy les fesoit rompre; et de tous ces cailloux il n'y en eut que deux dans chacun desquels on trouva un Rubi: l'un assez grand, qui pouvoit peser près de cinq carats, et l'autre d'un carat ou environ."

It would be in vain to look in any modern mineralogist for so accurate and instructive a description of the natural characters of the Spinel, and its variations, as that left us by Ben Mansur. "The Laal has four sorts: the red, the yellow,

the violet, the green like the Emerald. The same stone has often the one half red, the other green. The red species has again eight subdivisions, of which the first is the *Geschedunegi*; the seventh, *Edrisi*, is called the gem of Enoch. The *Geschedunegi* is especially agreeable, being pleasantly coloured and brilliant. The fourth, the *Lahmi* or flesh-coloured, is of a dark red. The gradations of the Laal are numerous, and persons experienced in precious stones are well apprised that between the Spinel, the Garnet, and the coloured Crystal (common Amethyst?) there is often no difference in the colour. The distinction between them consists in the greater hardness of the Spinel, which cannot be rubbed down upon the anvil. The coloured Crystal again, if held up against the sun, appears white. The Laal hath its epithet of *Bedaschan*, not because it is dug up in that place, so much as from its being sold there. In the times of the caliphate of the Abbasides a hill at Chatlan was burst open by an earthquake, and therein they found the so-called Laal-Bedaschan contained within a white stone as its matrix. It takes a polish with great difficulty, and for a long time they were unable to polish it at all, until at last they effected it by means of the gold marcasite called *Ebrendsche*. They find in the matrix smaller Spinel's sticking all around a bigger one, like the seeds in a pomegranate. The miners call the matrix *Maal*. They found in the mine first the red, and afterwards the yellow Laal. The stone belongs to the species of the Jacut (i.e. the red Corundum)."

The Romans experienced the same difficulty that exists now in distinguishing the various kinds of their Carbunculus from each other in consequence of the practice of jewellers to back them with various foils so as to improve their colour: "tanta est in illis occasio artis, subditis per quæ translucere cogantur." A delusion this, especially to

be observed in works of the Renaissance, where heads in relief, set in rings, often appear like the finest Rubies; but are in fact only Garnets backed by a ruby foil.* It was also believed in Pliny's time that the dull-coloured Carbunculi could be made lustrous by maceration in vinegar for the space of fourteen days; and that the effect lasted for the same number of months. These gems were also imitated so exactly in paste, that the false could only be distinguished from the true by touching them with the emery-stone (cote): the artificial substance being softer and brittle, inferior in weight, and sometimes showing silvery air-bubbles in the interior. And this is true to the letter, for in no other colour, except the Emerald, have the ancients been so successful as with the Ruby, in the making of their pastes: for example, an antique paste lately came under my notice bearing a splendid intaglio of Medusa's Head, which could with the utmost difficulty be detected to be not an actual Carbuncle, even showing all the flaws within its substance to which the real stone is so liable. These flaws in the imitative gem are produced designedly, by suddenly cooling the paste upon its withdrawal from the furnace.†

True Rubies, and of good colour, uncut but with their

* Infinitely more ingenious as well as deceptive is the device the Parisian trade has recently hit upon for imparting to pale, valueless Rubies the richest colour they ought to possess, and that, too, without the use of foil. The inside of the setting is filled with ruby enamel, which deeply tinges the entire stone enclosed therein; the Ruby is set a jour; and thus hells all suspicion of trickery to rest.

† The monster Ruby of Charles the Bold, set in the middle of a golden rose for a pendant (perhaps a Lancastrian badge, and a bribe from the suppliant Margaret of Anjou), captured by the Bernese after his rout at Granson, turned out, when purchased by Jacob Fugger, to be false. It was of a somewhat irregular heart-shape, one inch in the widest, and no doubt had come down to the Duke's times from the Roman. (Figured by Lambecius, Bib. Cæs. l. 516.)

natural surface rudely polished, occur both inserted into pieces of antique jewelry, and set in rings dating from the earliest times. In the Hertz Collection was a necklace formed out of native Rubies and Emeralds of fine colour and as large as horse-beans, drilled through and elegantly linked together with strong twisted gold-wire, in a similar manner (though much more substantially) to the Sapphire necklace from Rutupia noticed under "Hyacinthus." Such a mode of employing these very hard gems was long maintained. De Laet, writing in 1647, states that Rubies were then very generally set unpolished both in rings and in ladies' ornaments; for, "unlike the Diamond that hath no beauty save when shaped and polished, the Ruby charms without any aid from art." He remembered when it was still the custom (and an ancient one) for the gentleman to present the lady on their betrothal with two rings, the one set with a Diamond, the other with a Ruby table-cut. This gift went by the French name "Mariage."

The Ruby, though of the same chemical composition as the Sapphire, slightly yields to it in hardness; the Spinel, again, into which a small proportion of magnesia enters, is still softer; nevertheless, antique works in either are even more uncommon than on the Sapphire itself. As in modern, so in ancient times, the Ruby was far the rarer of the two, and therefore to violate its beauty by an engraving was regarded as the extreme of imperial extravagance. In fact, the experienced Lessing (A. Br. lxxix.), and later the Count de Clarac ("Cat. des Artistes Gr. et Rom."), altogether deny the existence of any really antique intagli in these harder gems; but the instances to be adduced under "Smaragdus" and "Hyacinthus" sufficiently prove that this rule, although generally true, yet admits of some, though rare, exceptions. Here is the place to remark that engravings on any of the "Precious Stones" are always to

be received with the greatest suspicion; modern artists, working for wealthy patrons, having found it their interest to employ such materials as could recommend themselves to their purse-proud employers by the mere value of the substance (one thing which, at least, they could appreciate), as well as by the art displayed upon it, which, in their eyes, would be frequently but a minor consideration. The ancient artists, on the contrary, chose only such stones as were best suited for the execution of their work, and for rendering the most perfect impression of it when required for its proper use; always, for both these reasons, preferring the Sard, in which engravings by the eminent masters of antiquity will be found executed in a larger proportion than in all the other gems put together. Entirely devoted to the one object, that of striving after artistic perfection, they altogether disregarded the paltry glory of overcoming difficulties by the fruitless expenditure of their invaluable time (a point in which many amongst the moderns, notably Louis Siries and Costanzi, placed their chief claim to reputation); neither did they ever dream of seeking for renown rather by the preciousness of the medium than by the excellence of the performance.

Nevertheless, a few works in Ruby of apparently indisputable antiquity have been observed by me amongst the thousands of other gems examined. First, on account of the quality—a large oval slightly convex stone, of the true “pigeon’s blood”* tint, and weighing apparently about 3 carats—is one in the Devonshire Parure (No. 17 in the Bandeau), engraved with a Venus Victrix—a but poor intaglio in the latest Roman manner. A full-length figure of Osiris in half-relief, seems a production of the

* The test of a perfect Ruby is its exact agreement in colour with the fresh blood of a pigeon dropped upon the same sheet of paper on which it lies.

Egyptian Revival under Hadrian. In Spinel, may be cited a most spirited Gorgon's Head (Praun) and a head of Pertinax, now in my possession.* In Balais, the finest head of a Bacchante in existence, seen in front face, and crowned with ivy, the expression of the countenance full of a wild inspiration, and the treatment of the flesh and of the flowing hair beyond all praise: a masterpiece belonging to the best days of Roman Glyptic art. For, at the side is perceptible in neat, but almost microscopic, letters the name EAAHN, previously known as occurring upon an exquisite bust of Antinous represented as Harpocrates (Orleans). This gem has been pronounced antique by the best judges in Paris, and was bequeathed as a precious souvenir by the late possessor, L. Fould, to Baron Roger (l'ainé). The earliest indubitable example of the gem-engraving of the middle ages as yet discovered by me is the Spinel of the Marlborough cabinet. It is a fine-coloured stone, three-eighths of an inch square; the intaglio a head in front-face wearing a crown with three fleur-de-llys, deeply cut and carefully finished. It much resembles that of our Henry VI. upon his great seal. The ring enriched with it is of his date, and highly ornamented, with the legend on the bezel, "Tel il nest:" "There is none like him." It is supposed with some reason to have been the betrothal-ring of Margaret of Anjou.

Some very noble works in Ruby have also been left us by Italians of the early Renaissance: for instance, an intaglio, a head of Thetis capped with a crab's shell, deserves especial mention from the similarity of its style to the

* Other intagli in Spinel might be quoted; in fact, they are far from being of the first rarity (particularly in the Sassanian class), but the stone is usually mistaken for the Almandine, or the Jacinth (the brownish red).

best Greek—the stone large, irregular, and of a pale rose-colour, formerly in the Hertz;* and as a work in relief, a head of Serapis in front face, executed in the grandest manner upon a large stone of immense value, by far the first amongst the *engraved* of the Hope Cabinet of Precious Stones.

Amongst her Majesty's Camei is preserved at once the most interesting work in Ruby and the earliest authentic portrait executed since the Revival. It is the head of Louis XII., upon a fine stone of considerable size, being half an inch in diameter. The drawing is correct, though with much of the stiffness of the Quattro-cento style about it; all the details are carefully touched in, and the relief is flat. Historic interest and artistic merit combine to render it an invaluable monument of the first age of the revived art. As Vasari extols Domenico dei Camei so highly for his *intaglio* portrait of Ludovico il Moro upon a Balais the size of a Giulio (a shilling), it is very probable that the Gallic subverter of the last of the Sforza line may have commanded the same engraver to perpetuate his own features also in this precious stone. We actually find Da Vinci transferring without scruple his services to the victor upon the expulsion of the Duke, his former munificent patron. This Ruby is set in a massy gold ring of the fashion of the period; bearing on the inside his name "Loys XII." with the date of his demise, 1515. On these grounds it may with reason be supposed a memento-ring sent on the death of the French king to his youthful brother-in-law, Henry VIII. The Orleans Cabinet also possessed a very remarkable Ruby engraved with the *intaglio* head of Henri IV., with the date

* Now Baron Rothschild's.

1598: which can only be attributed to his own engraver, Coldoré.

It must be remarked here that the Ruby never attains to the same dimensions as the renowned giants of the Diamond family. The largest seen by Garcias in India did not exceed 24 carats; and for this a prince in the Deccan had paid six *manus* (156 pounds' weight) of gold. But Rudolf II. possessed one as big as a small hen's egg, bequeathed to him by his sister, the queen-dowager of France. Although De Boot seems uncertain as to its real nature,* yet it had been purchased originally for 66,000 ducats. At present, the King of Ava actually is owner of one of the same incredible magnitude, said also to be perfect in all respects; which he wears for a pendant in his ear, a somewhat inconvenient piece of magnificence. The finest crown-jewel of Persia, (says Chardin, who examined the stone carefully in 1666) was a Ruby as big as a hen's egg cut in half, and that of the finest and deepest colour he had ever seen. On its upper part the name "Chaic Sophy" had been cut by its former master, perfectly regardless of the detriment thus occasioned to its beauty.

The names *Carbunculus* and *Lychneis* gave rise to many wonderful stories, suggested by their primary meaning to the fancy of the credulous Greeks. Thus Ælianus relates (H. A. viii.) how a certain widow, Heraclea by name, had tended a young stork which, having fallen out of the nest before it was fully fledged, had broken its leg, and how the grateful bird, on returning from the annual migration of its kind, dropped into her lap, as she sat at her door, a precious stone, which, on her awaking at night, she found to her astonishment had lighted up her chamber.

* All the great historic Rubies now extant are pronounced Spinel by modern mineralogists.

like a blazing torch.* A similar description is that retailed by Lucian in his account of the statue of the Syrian Goddess (Astarte). "The goddess wears on her head a gem called *Lychnis* (lamp-stone), a name derived from its nature; for from it a great and shining light is diffused in the night-time, so that the whole temple is thereby lighted up as though by many lamps burning. By day the lustre is more feeble, nevertheless it still presents a very fiery appearance."† Alardus, a Dutchman, writing in the year 1539, caps this legend with the following wonderful account of a similar gem: "Amongst other stones of the most precious quality, and therefore beyond all price and not to be valued at any equivalent of human riches, the gift of that most noble lady Hildegarda, formerly wife of Theodoric Count of Holland, which she had caused to be set in a gold tablet of truly inestimable value dedicated by her to St. Adelbert, patron of the town of Egmond; amongst these gems I say was a *Chrysolampis*, commonly called an *Osculan*, which in the night-time so

* The *Lychnites* is spoken of by Philostratus (Vit. Apoll. ii. 14) as placed by the stork in the fabric of her nest for an amulet against serpents. This explains why Ælian's stork should have selected the *Aspid* for the fee to its nurse. The luminous property is thus improved upon by Psellus (De Lapid. xii.): "The *Lychnites* is a stone that gives the power of seeing in the dark (*νοκταλῶν*) if hung round the neck. It also cures fluxions of the eyes, if tied in a linen cloth upon the forehead." Martial's "*Lychnis cerites*" is explained by what Plutarch (De Fluv.) has: "In the Hydaspes is found the stone called *Lychnis*, resembling oil in colour, and highly polished. It is discovered when the moon is waxing, to the sound of fifes, and it is worn by people of exalted rank."

† Epiphanius, under "Carbuncle." "When worn it is impossible to conceal it; for notwithstanding whatsoever clothes it may be covered over with, its lustre shows itself outside its envelope, whence it is called the Carbuncle." And almost in the same words, M. Ben Maasur: "The *Bidschade* (Garnet) is a clear stone of a pure water, that often loses not its lustre even when under the clothes."

lighted up the entire chapel on all sides that it served instead of lamps for the reading of the Hours late at night, and would have served the same purpose to the present day, had not the hope of gain caused it to be stolen by a runaway Benedictine monk, the most greedy creature that ever went on two legs. Afterwards, however, from the fear of being convicted of sacrilege by having so notable a gem in his possession, he threw it away into the sea near Egmund. Some traces of this stone still remain in the upper border of the before-mentioned tablet.* Creuzer, in his 'Description of the Tomb of St. Elizabeth at Marburg,' states that the same belief was to the last firmly held by the common folks as to the nocturnal luminousness of the huge "Karfunkel" set above the statuette of the Saviour upon the principle façade of this magnificent Châsse, in silver-gilt, made in the year 1249. This stone, on examination by him before 1808 (most of the gems were stolen after the removal of the Châsse to Cassel), proved to be no more than a common yellow Crystal or German Topaz, possessing, it is needless to add, no phosphorescent quality whatever, save to the eye of Faith, that by the same intense straining was of old enabled to discern the mystic light of Tabor. Such a property belongs, in reality, to no other precious stone than the Diamond, and *that* only retains it for a few minutes after having been excited by exposure to the sunshine, and then immediately carried into a dark room. This singular phenomenon must often have attracted the notice of Orientals on entering their gloomy chambers after long exposure to their blazing sun,

* Two centuries before Alardus, Sir John Mandeville, speaking as an eye-witness, reports: "This Emperour (of Cathaye) hath in his chambre, in on of the pyleres of gold, a Rubye and a Charboncle of half a fote long, that in the nyghte semethe so grete, clarte, and shynynge, that it is als light as day."

and thus have afforded ample foundation to the marvellous legends built upon this isolated fact by their fertile imaginations. If the Diamond possessed this virtue, *a fortiori*, reasoned they, it must also characterize the Ruby—a stone held by them then, as now, in so much higher estimation.* Gesner, her contemporary, relates that our Catherine of Arragon used to wear a ring set with a stone luminous at night, which he conjectures was a Ruby. Fraught with historic associations to the minds of Englishmen beyond all other gems is the huge Spinel set in front of the great Crown of England, having been a present to the Black Prince from Pedro the Cruel, upon the victory of Najera in 1367, and afterwards worn upon his helmet by Henry V. at the battle of Agincourt. It is an irregular oval, pierced through the middle, after the usual Indian fashion; and having this perforation filled up with a small stone of the same kind to conceal it.

Tollius quotes Wolfgang Gabelchever for a property of the Ruby more wondrous still. "It is worthy of notice that the true Oriental Ruby presages to the wearer by the frequent change and darkening of its colour that some inevitable loss or misfortune is not far off: and in proportion to the greatness of the coming evil so doth it assume a greater or a less degree of darkness and opacity—a thing which I had heard repeatedly from people of the highest eminence, and have, alas! experienced in my own person. For, on December 5, 1600, as I was travelling from Stutgard to Calwam in company with my beloved wife Catharine Adelman, of pious memory, I observed most distinctly during the journey that a very fine Ruby, her gift, which I wore set in a ring upon my finger had lost, once or twice,

* Ben Mansur puts the "Jacut" (after the Pearl) at the head of the precious stones, and of this species he makes the rose-coloured (Ruby) the first.

almost all its splendid colour, and had put on dullness in the place of brilliancy, and darkness in the place of light: the which blackness and opacity lasted not for one or two days only, but several; so that being beyond measure disgusted thereat, I took the ring off my finger and locked it up in my trunk. Whereupon I repeatedly warned my wife that some grievous mishap was impending over either her or myself, as I foreboded from the change of colour in my Ruby. Nor was I wrong in my anticipation, inasmuch as within a few days she was taken with a fatal sickness that never left her till her death. And truly after her decease its former brilliant colour again returned spontaneously to my Ruby."



HYACINTHUS: Ἰάκινθος: *Sapphire: Precious
Corundum.*

OF no ancient appellation has the proper attribution been so much and so variously disputed as of this. The earlier writers, such as De Boot, and De Laet, put it down without any hesitation as the finer sort of the common Amethyst; Millin and K. O. Müller regard it as the lighter-coloured variety of the same; the latter pretending that the name "Amethystus" only applied to the dark-purple kind. Bruckmann is uncertain whether it meant a pale Amethyst or a Garnet tinged with violet—the Almandine. Lessing, on the other hand, defines it as a reddish-brown fiery stone, the present dark Jacinth. All these explanations are based upon the exclusive consideration of the passage of Pliny's (xxxvii. 40) containing a brief and vague description of the Hyacinthus; for, curiously enough, it is not included in Theophrastus' list of ring-stones: perhaps in his age it had scarcely found its way into Greece from the remotest parts of India. Pliny's words are: "The Hyacinthus differs greatly from the Amethystus, although descending from a neighbouring colour (*ab vicino tamen colore descendens*). The difference consists in this, that, the violet splendour of the Amethystus is diluted in this stone, and, so far from filling the eye, does not even reach it, fading away more speedily than the flower of the same name." But what this *flower* was is fully as much a matter of dispute amongst the botanists, as is the nature of

the gem with the mineralogists. Pliny (xxi. 97) describes it as a bulbous plant, growing most abundantly in Gaul, and used by the natives for making the dye "hyssinum," usually translated, blue. Its juice had the singular property of checking the development of puberty in boys, and therefore was valuable in preserving their youthful bloom for the slave-market.* It was also an antidote against serpent-bites, another proof it was some powerful narcotic. Sprengel defines it to be the common gladiolus, an explanation overthrown by Pliny's distinction: "Post hanc gladiolus comitatus hyacinthis." Many others agree with La Chaux in considering it to be the tiger lily, with whom sides Milton, who has

"Like to the sanguine flower inscribed with woe."

A few make it to be the lark-spur, a purple flower, hence termed delphinium Ajacis, because inscribed with the name of that hapless hero. My own opinion, amidst this diversity, rather inclines to the blue fleur-de-lys, the blossom of which lasts but a day, and thus answers to one of Pliny's characters of the disputed flower. This is supported by Ovid's elegant description of its first springing from the blood of the youthful Hyacinthus:

"Flos eritar formamque capit quam lilia si non
Purpureus color hic argenteus esset in illis;
Non satis hoc Phœbo est, is enim fuit auctor honoris
Ipse suus gemitus foliis inscribit et AI, AI,
Flos habet inscriptum, funestaque litera ducta est."

The Roman "lilium" was equally wide in its acceptation as the Italian "giglio;" that the latter includes the iris,

* "Hyacinthus in Gallia maxime provenit, hoc ibi faco hyssinum tingunt. Radix est bulbacea, mangonicis venalicis pulchre nota, quia e vino dulci illita pubertatem coerces, et non patitur erumpere: terminibus et araneorum morsibus resietit, urinam impellit, contra serpentes et scorpiones, morbumque regium semen ejus cum abrotano datur."

the ancient badge of Florence still attests, at first *argent*, but subsequently turned into *gules*:

"Per division fatto vermiglio."

Orris-root (the Tuscan plant), too, is known to cause paralysis if largely taken, a point offering another analogy to the specific use of the ancient Hyacinthus.* Visconti actually figures a statue of Hyacinthus holding in his hand a fleur-de-lys for an identifying symbol. This flower, too, exhibits on the petals Apollo's cry of grief, "AI, AI," mentioned as its prime characteristic by the poet, and also by Pliny.† Pausanias, however, makes a distinction between the flower of Ajax and that of the Amyclee boy: "The people of Salamis say that the flower of Ajax first showed itself in their country after his death. It is *white* with a pink tinge, and, both in blossom and leaves, is smaller than the lily. The same letters are seen upon it as upon the hyacinthus" (I. 35). Again he has: "Their garlands are woven out of the flower that the people there (Corinth) call the 'cosmosandalon,' which is, in my opinion, the hyacinthus, both for size and for colour. Besides, there are upon it the letters expressing lamentation" (II. 35). The first of these was evidently our common Turk's-cap. But it is also quite as evident that the ancients gave the name of Hyacinthus to several totally distinct flowers, provided only their petals exhibited the necessary notes of woe.‡

* Similarly Hippolytus informs us the Eleusinian hierophants emaculated themselves by the external application of hemlock.

† "Hyacinthum comitatur fabula duplex, luctum preferens ejus quem Apollo dilexerat, aut ex Ajaxis cruore editi; ita discurrentibus venit ut Græcarum literarum figura A I, A I, legatur" (*ib.* 38).

‡ The Orleans gem would indeed set the question at rest were its antiquity certain, but unhappily the composition savours strongly of the Cinqua-cento taste. It represents the boy enveloped in the petals of an indubitable gladiolus-blossom just emerging from the earth, on which the god is engraving the disyllable of woe with the arrow of Cupid, who stands mournfully by in the act of breaking his now useless bow-string.

But to return to the precious stone. Pliny must have believed that it derived its name from its resemblance in colour to the flower; but there was as little foundation for this as for most other ancient etymologies in this department. The Indian name for the stone, of which the Arabic *Jacut* preserves the sound, was readily assimilated by the poetical Greeks to that of Apollo's favourite Hyacinthus, more properly written "Hyacis"—the more especially as there is some reason for believing that the gem, at least in later times, was accounted sacred to the sun.

The identity of names between Apollo's darling and the precious stone, gave origin to the epigram (ix. 751):

'Α σφραγὶς δάκρυθ' Ἀπόλλων δ' ἐστὶν ἐν αὐτῇ
καὶ Δάφνη· ποτίσῃ μᾶλλον δ' Ἀητοῖδας:

"Hyacinth the gem; Apollo graved thereon
And Daphne: which charms most Latona's son?"

But that the Hyacinthus of the ancients is the Sapphire of the moderns will be perfectly evident to every mineralogist who will carefully peruse the minute description of the same gem given by Solinus: "Amongst these things (in Ethiopia) of which we have treated, is found also the Hyacinthus of a shining *cerulean* colour; a stone of price if it be found without blemish, for it is extremely liable to defects. For generally it is either diluted with violet, or clouded with dark shades, or else it melts away into a watery hue through too great paleness. The best colour of the stone is an equable one, neither dulled by too deep a dye, nor too clear with overmuch transparency, but which draws a sweetly-coloured tinge (*florem*) from the double mixture of lustre and violet (*purpura*). This is the stone that feels the influence of the air, and sympathises with the heavens, not shining equally whether the sky be cloudy or bright. Besides, when put in the mouth, it is

colder than other stones. For engraving upon, indeed, it is by no means adapted, inasmuch as it defies all grinding (*attritum respuat*): it is not, however, entirely invincible, since it is engraved upon and cut into shape (*scribitur et figuratur*) by means of the diamond." In the preceding passage Solinus has noticed the production of cinnamon in the same district, which, as the native country of that spice, must have lain very far south in the Indian Ocean. "Æthiopia" and "India" are frequently used indiscriminately by the writers of the Decline; Heliodorus, for instance, talks of the gymnosophists, bamboos, and amethysts of the former country—things all peculiar to the latter.

Three characters in the above passage apply to our Sapphire, and to no other gem; the lustrous sky-blue colour, its liability to be clouded with shades of indigo or with watery blue, and its pre-eminent hardness—the last quality, indeed, being possessed by it in the next degree to the Diamond. Pliny's account of the Hyacinthus, already quoted, agrees in the main with the above, though his description of the gem is far from being so explicit as that of Solinus, who was evidently a connoisseur in precious stones, and throughout the whole of his compilation has successfully laboured to rectify and elucidate the somewhat loose and confused language of the great naturalist. Solinus, to judge from his style and certain historical allusions to be discovered in his text,* flourished two centuries after Pliny, when the active commercial intercourse with India, established in the reign of Trajan, had made the Romans

* For example, he speaks of a temple of Hercules still venerated, standing in the Forum Boarium, protected by his club (the original) from the entrance of all *Ætes*, which proves him anterior to Theodosius, and of the fall of the Parthian empire, which equally makes him later than Sev. Alexander.

much better acquainted with the more peculiarly Indian gems. For then, as in our day, real Sapphires came from Ceylon exclusively; those so often quoted as to be found at Expailly in France being, according to Barbot, nothing more than blue crystals of Quartz. The ancient Indians obtained their Hyacinthi out of the beds of torrents, just as the Cingalese do their Sapphires to this day, for the gem never occurs, in the matrix, but in rolled pieces mingled with the gravel. This peculiarity of their origin is elegantly alluded to by Naumachius (v. 58), where, speaking of the "purple Hyacinth and the green Jasper, in which the foolish glory," he adds, "they are but stones upon the pebbly beach of the sea, and cast in numbers at random upon the banks of torrents."

"Dote not on gold; nor round thy neck so fair
The purple hyacinth or green jasper wear:
For gold and silver are but dust and earth,
And gems themselves can boast no real worth:
Stones are they scatter'd o'er the pebbly coast,
Or on the torrent's bank at random toss'd."

Some of the varieties of Pliny's Adamas were indubitably grey or pale Sapphires, to judge from his description of their distinctive characters. The steel-colour and great weight which he assigns to the Siderites prove this to demonstration; for no other terms could so exactly express the tint of the unpolished paler Sapphire, or its unparalleled density; for its specific gravity is actually one degree greater than that of the Diamond. The "aëreus color" also of his Adamas Cyprius is the sky-blue of our finest Sapphire, its hue being the exact shade of the "air" or pure heaven in the climate of Rome:—

"Aëris ecce color tunc cum sine nubibus aer."—OVID, *A. A.* iii. 174.

"The colour of the air is seen on high
When not a cloud obscures the tranquil sky."

Again, Epiphanius twice repeats the epithet ἀσπερίτης applied to the "Adamas," worn, according to his version, by the High-Priest over the Rationale, and itself constituting the δῆλωσις, or Urim and Thummim, the "Manifestation of God's Will," signified by the changes of its colour: "And between these (two little shields) hung the 'Declaration,' that is, the aforesaid Adamas, resembling the sky in colour. . . . And thrice a year, as already said, the Future was foreshewn unto the people by means of the Breastplate. For if they were found in sin, and not walking in the Commandments which God gave unto them, the colour of the stone, they say, was changed, and it became *black*: and from this they knew that the Lord was about to send death upon them. But when He was about to give them up to the sword, then it became like unto *blood*, as He says in Jeremias, 'Send out his people and let them go forth; as many as are for death, unto death; as many as are for the sword, unto the sword; as many as are for the famine, unto the famine; and as many as are for captivity, unto captivity.'" And be it remembered that Epiphanius was a *Cyprian* bishop. Pliny also states of this species that, besides having this blue tinge, it could be perforated by means of another diamond, i.e. of the true Indian sort, to which alone the Sapphire yields in hardness. The modern name Sapphire is a mere epithet expressive of its colour: the ancient Sapphirus or Lapis-lazuli furnishing the paint ultramarine, *sapphirinus* came to signify "azure," exactly as "Nilaa," the present Indian name of our Sapphire, does.*

* In Pliny's list of *green* gems stands actually a "*Nilion* found in India, of a tint dull and so faint as to disappear on a close examination; somewhat resembling a smoky Peridot, or sometimes of a yellowish cast." A bad Sapphire doubtless: where the pale blue goes off into a dirty green; a common defect. Or it may have been the *Sappare*, composed of silica and alumina in nearly equal proportions, in colour a russian blue, fading off into grey or green, which Barbot says is still

We find the blue species of the Precious Corundum already, at the close of the fifteenth century, designated "Sapphirinus" simply by Camille, in his 'Speculum Lapidum,' to distinguish it from the red and yellow varieties of the same class, the Ruby and Oriental Topaz.

The Hyacinthus of the Romans is invariably blue* and lustrous; even Isidorus, in the sixth century, contenting himself with an abridgment of the already quoted passage of Solinus. Thus we find Martianus Capella speaking of the "flusticolor profunditas Hyacinthi," the dark violet of the Mediterranean before a storm—

"ὥς δ' ὅτε πορφύρῃ πέλαγος μέγα κύματι κωφῇ"—Π. xiv. 116—

or the billows shining, as Catullus hath it, "purpurea a luce." So Heliodorus (*Æth.* ii. 30) extols the Hyacinthi in the necklace of Queen Persine, "as imitating the colour of the shallow sea, under a steep rock, quivering gently, and tinging with violet the bottom." From this comparison appears also the appropriateness of the favourite epithet *τακύνθων* as applied to the flowing hair of southern beauty, the black of which exactly represents the violet reflex of the raven's plumage. In the panegyric upon an imperial bride, found by Mai in a MS. of Symmachus and of the same date (fifth century), the rhetorician describes the "Hyacinthi *tetra luce vibrantes, quum luminibus claris*

sent into the market from India, cut and polished, for a variety of the Sapphire. Besides the difference in its blue, it is much softer than the Corundum.

* A question settled, if further proof be wanted, by Josephus in his interpretation of the mystic meaning of the colours in the Veils of the Temple (*Antiq.* 156) "the veils being woven out of four (colours) allude unto the nature of the elements: for the *fine linen* indicates the earth because the flax springeth out of the same; the *purple*, the sea because it is dyed red with the blood of the shell fish; the *hyacinth* signifies the *air*, whilst the *red* will be an emblem of the fire."

mixtæ cernuntur emicare nigredines." The "gloomy lustre" and "mingled blackness," or deep violet, aptly illustrate the preceding remarks.

Epiphanius, however (A.D. 400), notices some other important varieties of this gem.* He divides the Hyacinthus into five sorts, because the deeper in colour the greater the value of the gem, inasmuch as the Hyacinthus, like dyed wool, displayed various shades of purple. The first quality was called *Thalassites*, or *Marine* (i.e. deep blue, according to the analogy of *Venetus* and *ultramarine*); the second, the *Rose-coloured*; the third, *Nativus*; the fourth, *Chanisæus*; the fifth, the *Pale*. All came from the interior of Scythia, and possessed the property of not merely being uninjured by fire, but even of extinguishing it when thrown in, and, moreover, of rendering incombustible the linen in which they might be wrapped. In this list the third name, "*Nativus*," discloses a curious fact, for De Laet quotes Zosimus Panopolitanus to the effect that "*Natef*" is the Arabic for *φοινικαστέλλος*, "a cake of vermilion paint." It is therefore evident that Epiphanius had derived his information about this stone from some Oriental source, which accounts for his more accurate acquaintance with its varieties, like the Ruby, differing indeed in colour, but identically the same in chemical constitution. Still more strange is it to find Marbodius, in the eleventh century, venturing here to leave his usual guide, Isidorus, and, following the example of Epiphanius, but with still greater accuracy, to make the three divisions above alluded to, the blue, the red, and the yellow; and with an exactness of arrange-

* He ventures a conjecture that the "*Ligure*" of the LXX. must be the Hyacinthus, because in their list of precious stones (in the *Rationale*), they have made no mention of the latter, though both a beautiful and a valuable gem.

ment most surprising at that early period, referring them all to the same species—the actual modern classification.

Epiphanius could only have drawn his information upon this head at second-hand, from some Persian source, like that preserved to us in its full integrity by the accurate Ben Mansur. “The *Jacut* has six divisions; the Red, the Yellow, the Black, the White, the Green or peacock-coloured, the Blue or smoke-coloured. The first, or the Red, is subdivided into the Rose-coloured, the Purple, the Yellowish-red like, the *Carthamus*-flower (our safflower dye, the French *Ponceau*), the Flesh-coloured, the Porphyry-coloured, and the Pomegranate-coloured.

“The second species, the Yellow, has three subdivisions, the Apricot, the Orange, and the Straw-coloured.

“The third and fifth species (the Black and the Green), and the second and fourth (the Yellow and the White), are one and the same.

“The sixth, the Blue (our *Sapphire*) has four subdivisions, the Light Blue, the Lapis-lazuli Blue, and the Indigo Blue, of which every one again has peculiar shades and gradations.

“But others divide the *Jacut* into only four species, the Red, the Yellow, the Dark, and the White, uniting the Peacock-coloured and the Blue under the Dark.

“The *Jacut* cuts all kinds of stones except the Carnelian and the Diamond, and is itself only cut by the latter. The lustre of the *Jacut* belongs to no other stone except the Laal (Spinel) from Dedaschan; it is also harder (heavier?) than all other stones, and is cold in the mouth. The Red *Jacut* becomes white in the fire, but being taken out therefrom, it again recovers its proper colour. When engraved upon* it is called *Memeutr*; but when in its native state *Adschenri*.

* Rather, I suspect, ‘when cut and polished.’

"The stones that resemble the Red Jacut are six, viz., the Laal, the Bidschade, the Benefsch, the Kerkend, the Kerkin, the Kuzer (probably different species of the Garnet). Of these the Kerkend is dark-red; the Kerkin black-red, but transparent in the sun. The Kuzer has all the colours of the different sorts of the Jacut.

"The distinction between the Jacut and the stones resembling it lies in this, that it *scratches* all the others, is heavier, and resists the fire. Thus the White Jacut is heavier than the Crystal, which it often exactly resembles to the eye.

"*Mines of the Jacut.*—On the island Saharan, 62 parasangs in diameter, and lying 40 parasangs behind the island of Ceylon, there is a high mountain where Jacuts of all the colours are dug up. In A.H. 669 (A.D. 1270), to the east of the village *Tara*, in the third clime, in the same longitude as the Canaries, and half-a-day's journey distant from Cairo, there was discovered a mine of Jacuts; although many maintain that except in Mount Saharan there exists no other mine of the Jacut."

On account of its extreme hardness, the ancients for the most part employed the Sapphire as a mere ornamental stone for setting in their jewelry, unengraved and unshaped; contenting themselves with giving a tolerable polish to the native irregular surface of the pebble. Sapphires appear thus in the barbaric imitations of later Imperial pomp that have come down to our times: in the Lombard crown of King Agilulph; in the Iron Crown of Monza, the gift of Queen Theodelinda; in that of Hungary made by the order of Michael Ducas, as a present for Geisa, in 1072; and above all, in the magnificent crowns of the Gothic king Receswinthus, of his queen, of Sonnica, and the other nobles lately discovered at Fuente de Guerrazar,

near Toledo. Claudian enumerates amongst the treasures of the Emperor Theodosius left in Stilicho's charge—

"viridesque smaragdo
Loricæ, galeasque residentes hyacinthis."

Amongst the Rutupine antiquities preserved in the library of Trinity College, Cambridge, is a portion of a necklace of small rough Sapphires, drilled at each end, and linked together with gold wire, the exact ornament referred to by the poet Naumachius.

Previous to the Imperial epoch, engravings in Sapphire are of the rarest possible occurrence. A small Etruscan scarabeus, however, on an inferior variety, has recently come under my notice, and also a magnificent head of Jupiter inscribed IIY, executed in the purest Greek style. This latter had been accidentally discovered ornamenting the pommel of a Turkish dagger, the intaglio turned downwards, and the back of the stone rudely faceted by the Oriental lapidary into whose hands this precious monument had fallen, an additional proof of its genuine antiquity. This stone was one inch in diameter (Rosanna, Mexico). Even superior to this as a work of art, and belonging to the same school, is the Medusa's Head in nearly full face, one of the chief glories of the Marlborough Collection; displaying most exquisite finish combined with the utmost vigour, and which would render precious even an ordinary material, but are greatly enhanced here by the fine quality of the Sapphire, cerulean and clear. Another of larger size ($\frac{3}{4} \times \frac{1}{2}$ inch) in the same collection, a stone of much deeper azure, though streaked with lighter shades, bears the head of Caracalla, as good a work in point of art as his times could produce, but in which the peculiar execution bears testimony to the difficulties of the task, the hair being made out by a series of drill-holes

set close together to express the short curly locks of the irascible tyrant. A singular vitreous polish has been given to the interior of the intaglio, the infallible characteristic of all really antique work in gems of exceptional hardness. One of the most singular intagli on Sapphire I saw in the hands of Mr. Böcke (in 1860). It represented an actor closely wrapped up in his *pallium*, seated and bending forward with the comic *pedum* in his hand, over a huge mask set upon the *thymele*, or cylindrical Bacchic altar in front of him, as if addressing it; another mask was hung on the back of his chair, and a second actor stood behind imitating his gesture: upon a large pale stone. Amongst the Townley gems may be seen a spherical Sapphire, perfect in colour, and of considerable size, engraved simply with the Christian monogram, doubtless the signet of some Byzantine patriarch. But the most famous of all is the signet of Constantius II. (now in the Rinuccini Collection), on a perfect stone,* weighing fifty-three carats. The Emperor is represented as spearing a monstrous wild boar, designated upon the stone as ΕΜΦΙΑΟ (from his sword-like tusks), before a reclining female figure personifying "Cæsarea of Cappadocia," the scene of the exploit. The inscription CONSTANTIVS AVG in the field manifests that this costly stone had been engraved for the actual signet of the imperial Nimrod. There was lately on sale in London a unique work in relief in the same material, the well-known design of Hebe feeding the Eagle; the stone, heartshaped and of fine colour, $1\frac{1}{2} \times 1\frac{1}{2}$ inch in dimensions. The execution, apparently belonging to the times of Hadrian, possesses considerable merit, though producing but little effect, from the clouded surface of the gem upon which such admirable skill and patience have been thrown away, a circumstance of itself attesting the date of its execution.

* This gem has been long known: Ducange first published it.

The stone has a hole drilled through its longer axis, evidently done in India, that it might be worn as a bead, before it was purchased by the Roman lapidary, to be engraved as a cameo.

Of the rare Gothic attempts at gem-engraving, by far the most noteworthy is the *supposed* head of Matthew Paris, on Sapphire, surrounded with his well-known motto. (Waterton.)

Of modern works of the kind, the finest ever done is the portrait of Pope Paul III., ascribed, no doubt with justice, to the far-famed Il Greco (Pulsky Gems). It is a beautiful Sapphire, three-quarters of an inch square, a truly inestimable gem, both for its fine quality and the spirit and life of the engraving, and was certainly the signet of the Pontiff himself. Inferior to this in point of art, but possessing great historical interest, was the bust of Henri IV. (seen by me in 1859), by Coldoré, his engraver, with his initials, C. D. F., on a large octagonal stone of pale colour.* A number of pale Sapphires are to be met with, engraved with heads or figures, usually but poorly done, in the style of the Cinque-cento. The reason is explained by De Laet (i. 7):—"The sort which is pale, or watery, is painted on the back with indigo, so as to imitate the sky-blue and superior kind, although this artifice is forbidden to jewellers to employ unless there be something engraved upon the stone, in order that its quality may be distinguished."

The pale Sapphire can be rendered entirely colourless by exposure for some hours to a regulated heat, and thereby acquires great brilliancy, so as often to be passed off for

* Coldoré was fond of perpetuating his great master's image upon stones of price; besides the Ruby of the Orleans Cabinet, already noticed, the French possesses two upon emerald, one of which is like the Sapphire above quoted, of an octagonal figure.

the real Diamond. But there is one infallible distinction between this uncoloured gem, and also between the White Topaz, and the true Diamond, that neither possesses the iridescence always displayed by the latter when catching the light at a certain angle.*

De Boot states (ii. 32) that he had seen an Oriental Amethyst (i.e., a purple Sapphire) treated in this way, valued by the Imperial jeweller at 200 thalers, in consequence of its possessing the true water of the Diamond, and which could not be distinguished from a real Diamond of the same size and shape which had cost 18,000 gold pieces. The engravings on Diamond really done by Birago, Jacopo da Trezzo, and other artists of the Renaissance, were often imitated by others, their contemporaries, either upon this material or the White Topaz.

In this class of gems the subject-matter, the Precious Corundum,† is extremely capricious in the colours it assumes, from the various natural influences that may have unequally affected the crystal during its formation: sometimes the same piece will be blue and red at opposite ends, each portion quite distinct; sometimes the colours run into each other, producing a lilac in their junction; at other times the two combine, yet separate when viewed at different angles, so that the same piece is in one light blue, in another lilac; or again, the deepest indigo and perfect whiteness are found in the same crystal, and so on. A curious variety occurs when the mass is made up of concentric layers, like the coats of an onion; such a gem, when polished, is opalescent, and if skilfully cut, with proper attention to the arrangement of the layers, will pre-

* The Cinque-cento jewellers, however, had the art of cutting the pyramidal crystals, often set by them in their "tower" rings instead of the diamond, so as to obtain to a certain degree this rainbow-play of colours.

† From "Koorun" the Hindoo name for Emery.

sent a beautiful star, with delicate silky rays regularly divergent from one centre. This was in all probability Pliny's *Asteria*. (*ASTERIA*.)

The remarkable coldness of the Sapphire to the touch, due to its great density, gave rise to the notion recorded by Epiphanius of its power to extinguish fire, or natural antagonism to heat. This was improved upon by mediæval credulity into the doctrine that "the Sapphire worn in a ring or in any other manner is able to quench concupiscence, and for that reason is proper to be worn by the priesthood, and by all persons vowed to perpetual chastity." (Vossius, '*De Phys. Christ.*' vi. 7.) And furthermore, "the Sapphire is said to grow dull if worn by an adulterer or lascivious person."* In this belief originated its adoption to adorn the episcopal ring of office from the commencement of the Middle Ages down to the present time: the ring of the Abbot of Folleville (Braybrooke Coll.), the oldest ecclesiastical jewel extant, is set with a large native Sapphire.

* The Malthusian virtue of the species went much further than this, even to obviate the results of the infraction of its influence: "*Aristoteles ponit quod prægnantes ad abortum præparent.*" ('*Spec. Lap.*' p. 113.)



MARGARITA: and later, MARGARITUM:
Μαργαρίτης: Pearl.

THIS word is merely the Greek form of the Sanscrit *Maracata*, or the Persian *Merwerid*, and approaches yet more nearly to the original in *Μάργαδος*, used by Menander (Ath. iii. 94). Theophrastus, however, writes *Μαργαρίτης* (36) in his brief notice: "To the number of gems held in estimation belongs that called the Margarites: transparent by its nature; and they make out of it the necklaces of great price. It is found within a shell-fish resembling the *πίνα*, only smaller. In size it is as large as the eye of a tolerably big fish." It seems to have been known from the earliest times to the Asiatic Greeks in consequence of their intercourse with the Persians, ever the greatest admirers of the Pearl. Homer (Il. xiv. 183) describes Juno's ear-rings as *τρίγλῦνα*:* this epithet "triple-eyed" can hardly apply to anything but the Pearl, especially as no precious stones are ever alluded to by this poet. A triplet of pear-shaped pearls forms a distinctive attribute of the antique heads of this goddess. Three pearls strung one above another, and increasing downwards in size, composed the ear-pendant most admired by the Persian queens, as their portraits on the gems manifest.

Athenæus (iii. 93), gives an admirable account (modern

* *Glau* is still Welsh for bead, the name was imported with the article of coloured glass by the Phœnician traders who paid in this manufacture and in salt for the tin of the Britons.

research can offer no better) of the natural history of the pearl-oyster, extracted from the *Periplus* of India by Androsthenes: "Of the Strombi, and the Porcellanæ, and the other shell-fish there are numerous varieties, and very different from those with us. There is also a great abundance of the *Murex* and other oysters: but there is one peculiar kind which the natives call *Berberi*, from out of which comes the gem *Margarites*. This latter is highly valued throughout Asia, and is sold amongst the Persians and the regions inland for its weight in gold coin (πρὸς χρυσίου).* The appearance of the shell is similar to the *Pecten*, it is not however striated, but has the outside smooth and furry. Neither has it two ears like the *Pecten*, but only one. The gem grows within the flesh of the oyster, just as the measles (tubercles) in pork. One kind is extremely yellow,† so as not readily to be distinguished when placed by the side of gold; another is like silver; a third perfectly white resembling a fish's eye."

Chares of Mytilene, in the 8th Book of his *History of Alexander*, says: "It is caught in the Indian Sea, and also off the coasts of Armenia, Persia, Susiana, and Babylonia, and resembles the Oyster; but is both bulky and long, containing meat both large and white, and of very agreeable odour. From which they extract the white bones and call them *Margaritæ*, and make out of them necklaces, and bands for the arms and ankles; on which both Persians and Medes and all the Asiatics set a much higher value than upon those made of gold."

But the fullest details, as to both fish and fishery, are to

* Some high multiple must have dropped out here: it is incredible that a thing so greatly prized should only have been estimated at weight for weight in gold.

† This is the sort most valued by the Chinese at present; from its coming first in the list given by the old Greek traveller it would appear to have held the same rank in the estimation of the Indians of his day.

be found in the Description of Parthia, by Isidorus of Charace: "In the Persian Sea is a certain island* where great plenty of the pearl-oyster is to be found. Wherefore rafts of reeds (bamboos) are stationed all around the island, from off which the divers, jumping into the sea to the depth of 20 fathoms, bring up two shells at a time. They assert that when there are continuous thunderstorms and falls of rain (the Monsoon), the Pinna then breeds more freely, and the pearl becomes most plentiful and of good size. In winter the shell-fish are wont to retire into their holes in the deep, but in summer they swim about with their valves gaping wide open by night, but keep them closed by day. All that grow close to rocks or stones put forth roots, and abiding there fixedly breed the Pearl. They (the Pearls) are born alive, and are nourished through the part attached to the flesh. The latter is firmly fixed to the mouth of the shell, and is furnished with claws and catches food. This part is exactly like the little crab called the Pinnophylax. From this the fleshy part extends as far as the middle of the shell like a root, along which the Pearls are bred, and grow through the solid part of the shell, and increase in size as long as they remain attached thereto. But when the fish recedes along the length of its projection, and gently cuts off and severs the pearl from the shell, though it envelopes the pearl it no longer nourishes it, only renders it more polished, more transparent, and purer. The pinna of the deep water produces the most lustrous, and clear, and largest pearl; that which swims near the surface is spoilt by the rays of the sun, and gives those of bad colour and smaller size. Those that fish for Pearls run a danger when they thrust their hands straight into the gaping shell, for then it shuts

* The Bahrein Islands in the Persian Gulf.

to, and often snaps off their fingers: and some are thus killed immediately. But all who put in the hand transversely, easily pull away the shells from the rocks."

These same authorities Pliny seems to have followed in his account (ix. 53) of the formation of the Pearl: merely adding that the impregnation was produced by the dews of heaven falling into the open shells at the breeding time; an essential point evidently omitted by Athenæus from his abstract of the passage in Isidorus. The quality of the Pearl varied according to that of the dew imbibed, being lustrous if that was pure; dull, if it were foul. Cloudy weather spoilt the colour, lightning stopped the growth, but thunder made the shell-fish miscarry altogether, and eject hollow husks called *physemata* (bubbles). He adds that Taprobane (Ceylon) was then, as until lately, the seat of the most productive fishery. Pliny remarks the formation of Pearls out of numerous concentric layers (multiplici constant cute), and hence properly concludes them to be mere callosities formed in the body of the fish. In fact the pearl is only a concretion of the matter lining the shell that accumulates upon some foreign body accidentally introduced into the shell (usually a grain of sand), for the purpose of preventing the irritation its roughness would otherwise occasion to the tender inmate.*

Those of hemispherical form were called Tympania (tambourines): the shells to which some were firmly attached were preserved in this condition to serve the Roman fair ones for perfume-holders. There was a story that the shoals of pearl-oysters had a king distinguished

* The Chinese, in their national love of monstrosities, have turned to good account this resource of the mollusk, and by introducing miniature idols of stone or brass within the shell of the living fish withdraw them after a certain lapse of time, and find them so completely coated as to resemble true pearls of the most grotesque configuration.

by his age and size, exactly as bees have a queen, wonderfully expert in keeping his subjects out of harm's way; but if the divers once succeeded in capturing him, the rest straying about blindly fell an easy prey. Though defended by a body-guard of sharks, and dwelling amongst the rocks of the abyss, they cannot, says Pliny, in his pithy way, be preserved from ladies' ears.

The shells when caught were thrown into vessels filled with salt, and left there until all the fish was consumed, leaving the Pearls, "its kernels," at the bottom.*

The Red Sea Pearls were the most transparent; the Indian, though superior in magnitude to all the others, had something of the opaque lustre of tale. Those of the best quality were distinguished by the title "*Exaluminatæ*," i. e., clear as a globule of alum. Others, though very inferior to the two sorts just named, were fished up in the Mediterranean, in the Bosphorus where they were found in the mya-shell (pearl-mussel), and off the Acarnanian coast in the pinna (scallop); these last were mis-shapen and opaque like marble. Those obtained off Cape Actium were better, though always small-sized; as were also those procured off the Mauritanian coast. It had been ascertained that they were natives also of the British waters, though there was proof positive (constat) of their being only small-sized and bad-coloured, for Julius Cæsar "had wished it to be known," by the inscription placed upon it these words imply, "that the breastplate dedicated by him to Venus Genetrix was made out of British Pearls."

Pearls are still procured in large quantities from Scotland, and are much used in London-made jewelry, being, when recent, hardly distinguishable from the Oriental. They are, however, liable to the great defect of turning

* The best account of the modern mode of carrying on the fishery will be found in Percival's 'Ceylon.'

black by wear, and therefore were of incomparably lower value than the latter. But of late two causes have given an enormous development to the Scottish fishery: the first being the failure of the Indian; the second, its largely producing the rose-tinted kind, now infinitely the most esteemed in Parisian high life—a change of taste effected recently “*mulierum sane senatus-consulto*.” These Scottish Pearls attain to a considerable size: one weighing 30 grains and of fine quality was found at the confluence of the Almond and Tay in the summer of 1865. De Boot notices their existence in Scotland in his own times; and also in Silesia and Bohemia, but adds they were all very insignificant. Of these the finest were found in the last-named kingdom near the village Horasdovitz, and these could hardly be known from the Oriental. But out of 500 shells opened by himself he got no more than ten good Pearls; all the rest being either black or yellow.

It may here be observed that the faculty of generating this precious concretion is not confined to a single species of shell-fish, large rose-tinted specimens of the greatest beauty being sometimes discovered in the West-Indian Conch.

The present commercial importance of the Scottish fishery demands a fuller notice, and the following details will doubtless prove of interest to many of my readers.

In spite of the unfavourable judgment of Pliny's, upon the character of the British Pearls, Marbodius, we may suppose, upon the authority of some Roman original, speaks of the British Pearls as equalling the Persian and the Indian species. Amongst the motives impelling Cæsar to attempt the conquest of Britain was the fame of its pearl-fisheries; for Suetonius records that when he was planning that enterprise he carefully compared the

British Pearls with the Oriental, frequently weighing them against each other with his own hands. This fact gives us a curious glimpse into the nature of the Gallic trade with this island, and the unlooked-for extent into which it had penetrated the remotest North. For Cæsar's only knowledge of the natural products of Britain must have come from those Gallic traders to whose commerce with our aborigines he in several places makes allusion.

And it must be remembered that except in the Ire, Cumberland, and in the Conway, North Wales, the pearl-mussel, at least the productive sort, is not met with elsewhere in Britain than in the remoter parts of Scotland.

The singular revival of this antique glory of our island demands some brief notice of its particulars. Pliny's remark implies that the fishing continued to be prosecuted in his times; the inordinate love of the Romans for the jewel would necessarily stimulate them to keep open every known source of the supply even though its productions were not of the highest quality. Whether Marbodius, in the passage just quoted, is speaking for himself, or in the words of another, is an open question. Neither has any mention of British Pearls in mediæval times occurred in my reading.

The fishery must, however, have been early re-opened, for it is stated that, between the years 1761 and 1764, Pearls found in the Tay and Isla were sent to London to the amount of 10,000*l*. But afterwards the production so far declined, that in 1860 all the Pearls that could be bought in those localities were no more in value than 40*l*., and there was only one professional pearl-fisher in all Scotland. In that year Mr. Moritz Unger, a gem-dealer of Edinburgh, stimulated by the fast-increasing scarcity of the Oriental species, travelled all over the pearl-producing district, and published his intention of purchasing all that could be

found, at a regular tariff. So marvellous an effect had this prospect of sure remuneration for their labours upon the practical genius of the natives that for the year 1864 (aided by the unprecedented drought which gave the fishers access to the deeper beds of their rivers) no less a sum than 12,000*l.* was paid to the *finders*, which represents an infinitely multiplied return upon the Pearls when brought into the market. The highest value of any one specimen as yet obtained is 80*l.* For the produce of the Doon fishery alone Mr. Unger paid above 150*l.* for each of the summer months of 1863, exclusive of what was privately sold in the neighbourhood. The finest have been found in the Tay, the Teith, the Doon, and the Garry. With the exception of four streams, all the rest of the pearl-producing are outlets of lochs. The lochs are supposed to be the nurseries and grand depositories of the mussel: a theory confirmed by the fact that in draining part of Loch Vennachar in 1860-1, for the purpose of constructing the Glasgow waterworks, immense quantities of the shells, and containing very fine pearls, were obtained by the workmen. ('*Illust. News*,' Sept. 17, 1864.) The finest Pearls are always found in the shells whose magnitude, wrinkles, and time-worn appearance bespeak their advanced age. This fact supports the theory of certain naturalists, already noticed, that the formation of the pearl is due to a provision of Nature for preventing injury to the tender flesh from the casual entrance of some hard body into the shell by coating it with layers of the same material that lines it, popularly known as mother-o'-pearl. In fact, many pearls when cut in two are seen to be formed upon a grain of sand for a nucleus. Some peculiar element in the *water* must, however, be essential to their generation, for though every brook and canal in England swarms with the identical mya, the pearl-bearing are, as it were, conspicuously restricted to

the few localities above specified. And that it was the latter that yielded the treasures which tempted Cæsar to cross the Channel is certain, for the pearls of our seas, found in the common oyster, are opaque and worthless.

Pearls in the ancient world held the highest rank amongst precious stones, and for an obvious reason—their beauty is entirely due to Nature, being susceptible of no improvement from art. On the contrary, in the more valuable, and which are also the hardest, kind of gems, the exact converse holds good, their innate beauties were but poorly elicited by the imperfect polish the Indian or the Roman lapidary was competent to give them. Hence the Persians, even down to the times of Ben Mansur, assigned to the Pearl the first place in the list; the Romans indeed followed the Indian rule of valuation, and placed it second after the Diamond, but this merely on the score of the talismanic virtues of the latter, not its beauty. It is on record also that the prices paid by the Romans for Pearls of exceptional magnitude far exceeded those given for any other kind of precious stone.

In all the portraits of the Sassanian kings the eye is immediately caught by the huge Pearl hanging down from the right ear, and which the artist, to judge from the care bestowed upon its exact representation, has evidently considered one of the most essential points in his image of his sovereign. His solicitude brings to our recollection the romantic tale so well related by that most entertaining of old chroniclers, Procopius (*'Bell. Pers.'* i. 4), concerning that Pearl of unrivalled magnitude obtained at the urgent entreaty of King Perozes by the daring diver from the custody of the enamoured shark, but with the sacrifice of his own life. And how vividly does he set before us the final catastrophe when disappeared for ever from the world this unparagoned miracle of Nature—when the Great King,

resplendent in all his jewels, at the head of his mail-clad chivalry, rashly charged the flying hordes of the Ephthalite Huns, and in the very act of falling into the vast pitfall (engulfing him, his sons, and his bravest nobles), into which he had been lured by their feigned retreat, tore from his right-ear this glory of his reign, and cast it, before himself, into the abyss, there to be eternally lost amidst the hideous chaos of crushed man and horse—comforted in death with the assurance of thus cheating the foe of the most precious trophy of their victory. Nor could the Huns, though stimulated to the search by the enormous offers of his Byzantine rival in pomp, the Emperor Anastasius, who promised five hundred weight of gold pieces to the finder, ever succeed in recovering from the pit of death the so highly-coveted jewel. And four centuries later the Byzantine historians lament more bitterly over the single matchless Pearl which fell into the hands of the Turks when Romanus Diogenes was taken prisoner by Alp Arslan, than for the loss of all the Asiatic provinces of the Empire, the immediate consequence of the same disaster.

As no two Pearls were ever found exactly alike, this circumstance gave origin to the name "Unio" (unique). But in Low Latin, "Margarita(um)" and "Perla" became a generic name, "Unio" being restricted to the fine, spherical specimens. Although the latter were then, as ever, the most prized, yet the pear-shaped were also admired. These were termed "Eleuchi." Ladies wore them fastened to their finger-rings; or two or three in a cluster in their ears, in which capacity they got the name of "crotalia" (rattles), from the musical sound they produced in clashing together. Even the poorer * classes

* The ancient paste-makers, despite their wonderful skill, must have deemed the *Orient* of the Pearl beyond the reach of their art, for they

strove after such a distinction, holding that the Pearl served for gentleman-usher to a woman in the streets (*lictorem foeminæ*). Similarly in our day the grand ambition of every Tuscan *zitella*, however poor, is to get "per fas et nefas" a necklace of many rows of Pearls, no matter how irregular or discoloured; such a possession, in most cases, sufficing for her dowry. The Municipality of Florence (nothing can more strongly exemplify the national taste) long gloried in the ownership of a magnificent single row of Pearls. This, after the restoration in 1849, was borrowed by the Grand Duchess, who having once got it was in no hurry to restore the prize, to the infinite consternation of that talkative community. It is devoutly to be hoped the unlucky princess has carried the spoil off with her, as a solace in exile, whilst her uncrowned spouse amuses himself by acting the

"vacuis ædilis Ulubria."

The greatest magnitude of all the class is attained by the Pearls extremely distorted in shape, aptly named by the French "*Perles baroques*." These malformations were ingeniously utilised by the fanciful taste of the Cinquecento jeweller, and, by the addition of the requisite members in gold enamelled, converted into sea-monsters to serve for pendants to the neck-chain. The Devonshire Cabinet possesses an enormous Pearl of the finest lustre, but singularly mis-shapen, skilfully converted into the body of a very graceful mermaid: a jewel valued at 2000*l*. A

have never counterfeited it, although the temptation to the experiment was stronger in this case than in any other. The method was not discovered before 1680, when one Jacquin, a rosary-maker of Paris, observing the pearly lustre of the scales of the small river-fish the bleak, conceived the bright idea of filling therewith hollow glass spherules prepared with a glutinous fluid. The manufacture has thriven ever since, the export from Paris now reaching 40,000*l*. yearly.

second very remarkable specimen of these allusive adaptations of the freaks of Nature, now belonging to Col. Guthrie, is thus described: "Cinque-cento Pendant in the form of a Syren; the head, neck, and arms of white enamel; the body of a very fine and large Pearl baroque, ending in scrolls and a fish's tail; beautifully enamelled and set with rubies. She is represented arranging her hair, with a comb in her right hand; her left originally held a mirror. This splendid gem was brought from India: it is of fine Italian work of the sixteenth century. On the back is inscribed '*Fallit aspectus cantusque Syrence,*' and '*D. LVD. R.*' It is suspended by three chains from an enamelled cartouche ornament; length $4\frac{1}{2}$ inches." The inscription gives this jewel a historical value, for it can only be interpreted as "*Donum Ludovici regis,*" the twelfth of the name, as the style of art demonstrates,—the work of some famous *orfice*, perhaps Leonardo da Milano (mentioned with praise by Camillo)—a trophy of his conquest of Lombardy presented by the king to some confederate prince. Its discovery in India may be explained by the fact of the large assortment of jewelry together with other French *objets de luxe* carried out thither by Tavernier and similar speculators in the next century: a work like this, then gone totally out of fashion in France, would be very likely to become included in a consignment of precious trinkets to the court of the Grand Mogul. Most fantastic of all is the Londesborough Unicorn, modelled out of two gigantic *baroques*, mounted by figures of France and Victory in sisterly embrace; its style proving it the decoration of François I. or his son. In the list of our Henry III.'s jewels occurs "*Una Perla ad modum camahuti,*" seemingly a baroque presenting some resemblance to a head in relief. The Romans of the Decline distinguished the perfectly spherical Unio from the Perle baroque, always terming the

latter "*Margaritum*." The Persians make twelve classes of the Pearl according to its shape, as round, egg-shaped, lenticular, grape-shaped, cradle-like, &c.; and as many according to the colour. The generic name is "*Merwarid*;" when bored it takes the name of "*Lulu*."

It was the Asiatic conquests of Pompey, says Pliny (xxxvii. 6), that first turned the taste of the Romans towards Pearls and precious stones. In his triumphal procession were carried thirty-three crowns made out of Pearls, a temple of the Muses supporting a sun-dial, and a portrait (bust) of the victor himself formed out of the same precious units. This last piece of extravagance excites beyond all reasonable measure the wrath of the old philosopher, who devotes several lines, chary as he generally is of space, to the objugation of such luxury, and interprets the ostentatious exhibition of Pompey's head on this occasion into a presage of the Divine anger, foreshowing that soon afterwards the same head severed from the body should be held up for a public spectacle. In such a precedent, adds he, Caligula must find an excuse for his wearing slippers made out of Pearls, or even Nero, who had wrought out of them sceptres for the actors in his theatre, and couches for his amours.

From this it appears that from their first introduction into Roman fashionable life Pearls had been used as materials for art. Not that they engraved in relief or intaglio upon so small and precious a body; the compositions above described must have been made up out of Pearls strung upon fine silver-wire or white horse-hair and thus fastened, in a kind of mosaic, upon a model of the shape required, just as the "*Lamb*" of the Golden Fleece, or our ornaments in seed-pearl are at present constructed.

Pliny mentions (58) having seen Lollia Paulina, widow of Caligula, completely covered over with strings of alter-

nate Pearls and Emeralds to the value of 400,000*l.* of our money; plunder gotten by her grandfather, Lollius, from all the princes of the East. As he remarks that she made this grand appearance upon no very grand occasion, but at a private marriage-dinner, we may infer he wishes his readers to understand that this display exhibited but a small portion of the contents of this lady's jewel-box.

The largest Pearl known to Pliny weighed half a Roman ounce and one scruple over ($234\frac{1}{2}$ grs. Troy). This magnitude has never been equalled in modern times, except in the case of the *baroques*. The finest in the French Regalia, as quoted by Barbot, did not exceed 108 grs. or $27\frac{1}{2}$ carats. De Boot names one belonging to Rudolf II. weighing 120 grs. "30 carats that cost as many thousands of gold-pieces." Philip II. possessed another, "as big as the biggest pigeon's egg" (says Gar. de la Vega, who saw it at Seville in 1579), of 134 grs. and valued by the jewellers at 14,400 ducats, but pronounced beyond all valuation by the engraver Trezzo. It was pear-shaped, in which form Pearls attain to greater magnitude than in the spherical. It came from the Panama fishery (carried on by the Mexicans long before the Spanish conquest) and was celebrated under the name of "*La Pelegrina*."* But by far the largest (perfect) specimen on record, as ever seen in Europe, was that of 480 grs. also pear-shaped, brought from India in 1620 by Fr. Gougibus of Calais, and sold by him to Philip IV. The merchant when asked by the king how he could have been bold enough to risk all his fortune in a single little article, replied "Because he knew there was a king of Spain to buy it of him." It

* A negro-boy found the shell, which was so small they were about to throw it back into sea without opening it. The slave was rewarded with the gift of his liberty, his master with the post of Alcalde of Panama. The pearl was presented to Philip by Don Diego de Temea.

now, according to Barbot, belongs to the Russian princess Yusoppouff. The only jewel ever purchased by Aurungzeb (who affected a pious contempt for all such pomps and vanities) was a perfect, round Pearl weighing $36\frac{1}{2}$ *ratís* or $127\frac{1}{2}$ grs. as Tavernier makes it. He also gives a drawing of "the largest and most perfect Pearl ever yet found," bought by the Shah in 1635 from an Arab coming from the Catifa fishery. The price paid was 32,000 tomauns, which he calculates at 1,400,000 livres or 56,000*l.* The weight was 192 *ratís* = 672 grs., and the shape an almost perfect heart. And to conclude this list of prodigies, the same traveller awards the palm for perfection and beauty (though not magnitude) to that possessed at the time by Aceph Ben Ali, prince of Nolennac, Arabia. Its weight was only $12\frac{1}{4}$ carats, $48\frac{1}{2}$ grs., so that many others far surpassed it in that particular. But such was the fame of its perfection that 140,000 livres were offered for it, and in vain, by Aurungzeb. Tavernier had the opportunity of examining this paragon at a feast at Mocha where it was exhibited to the company by the much-envied owner.

Ben Mansur reverses Pliny's estimation, and puts the Pearls of Serendib (Ceylon) before those of Arabia (Bahrein), these being the only two species known to him. The former fishery (the Condatchy banks) when first taken into its own hands by the British Government (1797) produced 144,000*l.*, and the year following 194,000*l.* Thenceforth it fell off, in consequence of the over-fishing of the beds. However it again revived, and during some years of this century was farmed out at 120,000*l.* annually to different speculators. At present it is totally closed in the hopes that by giving the banks a respite, their exhausted population may be recruited.

When the Panama fishery first came into the hands of the Spaniards it was incredibly productive, upwards of

697 pounds' weight of pearls being imported from it into Seville alone, in the year 1687. These ancient prizes were not forgotten in this country in the bubble year 1825 when joint-stock companies for every possible and impossible object were all the rage. One English company undertook the prosecution on a grand scale of the fishery on the Columbian coast; another that of the Pacific off Panama, on the opposite side. Both enterprises met with about equal success, and came to an end in the following year, having first sent home for the benefit of the shareholders sundry very promising reports and a few remarkably fine—shells.

Everybody knows the story told by Pliny about Cleopatra who, in order to outdo Antony's extravagance in that line, wagered that she would spend a sum equivalent to one hundred thousand pounds of our money (centies H. S.) upon a single dinner. When her lover ridiculed the banquet, upon its appearance, as far from coming up to her boast, she replied that it was merely an adjunct to the grand dish, and as she was wearing in her ears the two finest Pearls in the world, "hair-looms of Eastern kings," she threw one of them into a cup of the strongest vinegar standing before her, and upon its dissolving immediately therein, she drank it off. The fellow to it was about to share its fate, had not L. Plancus, the appointed umpire in the matter, snatched it from the queen's hand, and wasted no time in pronouncing that Antony had completely lost his wager. That same Pearl, upon Augustus' conquest of Egypt, was sawn in two to make a pair of pendants for the ears of the Venus of the Pantheon; the goddess, as Pliny aptly remarks, being very well satisfied with one half of Cleopatra's dinner.

It is unfortunate for this good story that no acid the human stomach can endure is capable of dissolving a

Pearl even after long maceration in it. Barbot has found, by actual experiment, that one layer was reduced to a jelly, whilst the next beneath was completely unaffected. No doubt the wily Egyptian swallowed her Pearl safe and sound, and in some more agreeable potation than vinegar, secure of its ultimate recovery uninjured: and invented the story of its complete and instantaneous dissolution, which be it remembered rested entirely upon her own testimony, in order to gain her wager.

The same experiment, however, adds Pliny, was known to have been tried somewhat earlier by Clodius son of Æsopus, a celebrated actor, who having discovered that dissolved Pearls possessed the most delicious flavour, did not selfishly confine his knowledge to himself, but provided each of his guests with the same precious potion. Pearls, in powder, were formerly considered an infallible specific in stomach-complaints: the effects must have been due entirely to the patient's imagination, the substance acting merely as a weak anti-acid, neither more nor less beneficial than the powder of any other shell.

The then rarity of *Mother-o'-pearl* gave it great value in the estimation of mediæval times, where it ranked next to the actual Margarita. Small plaques of it, set side by side with the true precious stones, embellish some of the Hispano-Gothic crowns, and also the chasings of the Marburg shrine. This usage of the substance explains the "*Tres cokille*" in the list of the jewels collected by Henry III. for his projected shrine at Westminster. During the same period the actual round pearl was often forged by filing bits of the nacreous shell into the proper shape and polishing the spherule thus produced as Theophilus has noticed. A more ingenious counterfeit of the same nature used to adorn the ears and necks of our grandmothers in the shape of the *Coeque de Perle*, produced by cutting out into an oval

shape the globose whorls of the brilliant shell of the Indian nautilus. These hemispheres were used singly with a backing, or sometimes neatly cemented together gave a complete round Pearl, of a circumference far exceeding any of the genuine treasures of the shell. They possess the true lustre and tone of the original, but are fragile in the extreme.

Cleopatra's Pearl seems, like the equally celebrated Charles the Bold's Diamond, to have had many pretendants to the honour of representing it in after ages. Treb. Pollio, to exemplify the wealth of Calpurnia, noblest of patrician dames, and wife of Titus, one of the "Thirty Tyrants," mentions her possession of the *two* Pearls of Cleopatra, as well as of a silver dish, a hundred pounds in weight, chased with all the history of her own family, the Pisos.



SMARAGDUS: Σμάργδος: *Emerald.*

It has been frequently asserted by writers on Gems, as Dutens (p. 36), K. O. Müller (Archæol. § 313, 2), that the ancients were not acquainted with the true Emerald (the combination of Glucina, Alumina, Silica), which they pretend was unknown in Europe before the discovery of Peru, from whence in the present day the market is exclusively supplied. In spite of the large numbers of Emeralds occurring in Indian jewelry, both in their native form and rudely cut into pear-drops and "tables," Tavernier declares his firm conviction that this gem was never produced in the East, neither on the mainland, nor in the islands; for that having made the strictest inquiry in all his journeys, no one was able to point out to him any place in Asia where they are found, and hence he arrives at the conclusion that all Emeralds brought from the East Indies must have been imported thither from Peru by the way of the Philippine Isles. In support of the same opinion Dutens asserts that in all the old Treasuries, like that of Loretto, St. Denys, &c., every kind of precious stone is to be found except the Emerald amongst the presents made to these ancient repositories by princes and other pious persons, previous to the discovery of the New World: a conclusive argument (if well-founded) that the Emerald was not

known to them before. And to give greater weight to this opinion, he says it was supported by the authority of the experienced mineralogist, M. d'Augny.*

But the careful consideration of the facts about to be stated will inevitably lead us to a very different conclusion, for they demonstrate that the Romans at least were plentifully supplied with the true Emerald, and even possessed the *Green Ruby*, Pliny's *Smaragdus Scythicus*, a much harder, and much rarer stone. In fact the same mountains that supplied them with the Indian Beryls (Canjarjum, in Coimbatore) yielded at the same time an equal abundance of the cognate species, the deeper-tinted Emerald.

In spite of Dutens' confident denial of their existence, we actually *do* find numbers of these stones, often of great size and beauty, adorning mediæval pieces of goldsmith's work (to say nothing of antique jewelry), made centuries before the discovery of America—a fact in itself sufficient to prove the previous existence of the gem in Europe, from whatever other region it might have been derived. Large Emeralds, besides Rubies and Sapphires, adorn the Iron Crown of Lombardy, presented to the Cathedral of Monza by Queen Theodelinda (upon her marriage, A.D. 589), at the end of the sixth century, and which has never been tampered with subsequently.† They equally appeared in the crown of her husband King Agilulph, also of the same date, though that had been remodelled into its last and more tasteful shape by the famous Milanese goldsmith Antellotto Braccioforte in the fourteenth century,‡ but yet

* Dutens tries to show that the *Smaragdus* was our Peridot.

† This far-famed Crown is a plain circlet of gold, lined with an iron "Nail of the True Cross," beaten out thin.

‡ Employed by the Chapter at Monza to repair their plate and jewels, much damaged in their transport from Avignon, where they had been deposited.

long before the discovery of the Peruvian mines. They may still be inspected as set in company with almost every other precious stone in the crown of the queen of the Spanish Goth Raseswinthus, lately found near Toledo (now in the Hôtel de Cluny), a work of the following century (625) to the Lombard jewels just adduced. They appear in the Cross of the German Emperor Lotharius, made in 823 (Sacristy at Aix-la-Chapelle), and in the Crown of Hungary, made at Constantinople in 1072 by the order of Michael Ducas. And, to conclude, a fine stone was to be seen in the tiara of Julius II., who died in 1513, thirty-two years before the conquest of Peru. This stone, engraved with the Pope's name, was long preserved amongst the jewels of the Louvre, but (according to Barbot) was presented by Napoleon to Pius VII.* And De Boot writing in 1600 remarks incidentally that "within these fifty years, since the Peruvians have been imported, the Oriental have greatly fallen in value: from half that of the Diamond to the quarter of the price." And no wonder: so vast was the importation of the hoards of the plundered Caciques and Incas that Joseph d'Acosta mentions that the ship which brought him home from New Granada in the year 1587 had on board two chests of Emeralds, each weighing a hundred pounds. Cellini also, speaking of the antique gems he used to buy of the Lombard diggers in the gardens and vineyards circumjacent

* Its shape was hemispherical, and magnitude considerable, being .055 mm. (about 2 inches) in diameter. The pope's name was cut on the middle.

† These when first brought over were looked upon with much suspicion by jewellers. Garcias ab Horta (1565) has: "*Sed et Smaragdi quæ ex Peru Novi Orbis provincia advehuntur, adulterationis suspitione non carent.*" An overwhelming refutation this of Tavernier's conjecture so ungroundedly accepted as an established fact by Dutens.

during his residence in Rome (from 1524 to 1527), in which line he boasts of having carried on a very lucrative* commerce with the Cardinals and other wealthy patrons of art, mentions the having thus obtained an Emerald as large as a bean, exquisitely engraved with a dolphin's head. This stone was of such fine quality that, when recut, "it was sold again for as many hundreds of scudi as it had cost me tens." It must be borne in mind that Cellini was by profession a connoisseur in precious stones, and, above all, that a performance so excellent as he describes it, must have been antique, the art of gem-engraving having only been revived in Italy a few years before his own birth in 1500.† And to wind up this list with a moral proof derived from Pliny's description of his best Smaragdus: "After the Diamond and the Pearl, the first place is given to the Smaragdus for many reasons. No other colour is so pleasing to the sight: for grass and green foliage we view indeed with pleasure, but Emeralds with so much the greater delight, inasmuch as nothing in creation compared with them equals the intensity of their green. Besides, they are the only gems that fill the eye with their view, yet do not fatigue it; nay, more, when the sight is wearied by any over-exertion, it is relieved by looking upon an Emerald. Indeed gem-engravers find no other means of resting the eye so agreeable; so effectually by its soft green lustre doth it refresh the wearied sight." After reading this just panegyric, or the poetical comparison in Heliodorus: "gems green as a meadow in the spring, but

* "Often making a thousand per cent. profit, though I had paid the finders well."

† Most conclusive evidence (were it forthcoming) would be the ring set with "Optimo Smaragdo," which Pope Adrian sent by John of Salisbury to Henry II. as the instrument of his investiture with the Dominion of Ireland; and which, as such, was preserved in the royal archives. Hence comes the "Emerald Isle."

illuminated with a certain oily lustre;" or the rhetorician's (appended to Mai's Symmachus) description of them in the jewels of the Imperial bride, as "playing with a quivering green" (so distinctive a character of the true stone); can any one longer doubt that the Romans were acquainted with the true Emerald, or suppose that they could have applied such terms of praise to the dull Plasma or opaque Malachite, which so many archæologists have contended were alone understood by the name *Smaragdus*?

It cannot, however, be denied that the *Σμάργδος* of the earlier Greeks signified any kind of green stone that was brighter and more transparent than their *Jaspis* (our Plasma). In no other way is it possible to understand Theophrastus (28): "Of stones used for signets, some for the sake of their beauty the *Smaragdus* possesses also some peculiar properties, for it assimilates the colour of the water into which it is thrown to its own colour—the stone of middling quality tinging a smaller quantity; the best sort all the water; whilst the worst only colours the liquid directly over and opposite to itself." (Meaning that it will give a greenish cast to the water by the reflection of its own colour, not by staining the liquid as most readers absurdly understand the passage. But this test is not now to be confirmed by experiment.)* "It is also good for the eyes: on which account people wear ring-stones made of it, for the sake of looking at them. But it is rare and small in size, unless we choose to believe the stories about the Egyptian kings; for some assert that

* I more than suspect that this strange story, as repugnant to common sense as to experience, depends upon a corrupt reading of *water* instead of *air*. Pliny, who has paraphrased in different places in his own description of the *Smaragdus* the corresponding passages of Theophrastus, had evidently read nothing in his copy about *water*, for he has "*preterea longinquo amplificatur visu, inferiores circa se repercutsum aëra.*"

one was brought to them, amongst other presents from the king of Babylon, four cubits in length by three wide; and that there are now standing dedicated in the temple of Jupiter four obelisks made out of Emerald, forty cubits long, and four cubits wide on one side and three on the other. But these accounts rest merely upon the testimony of their own writers. Of the sort called by many the Bactrian (*al. Tanos*) that at Tyre is the largest, inasmuch as there is a column of tolerable size in the temple of Hercules there: unless indeed it be the spurious Emerald, for there is such a kind found.* This last exists in localities easily accessible and well known—in Cyprus in the copper-mines there, and in the island lying over against Chalcedon. In the latter place they obtain the more peculiar (choicer) specimens—for this species of gem is mined after like other metals—and it runs in veins in Cyprus quite by itself, and that too in great abundance. Few pieces, however, are met with of sufficient size for a signet-stone, most of them being too small, for which reason they use it in the soldering of gold, for it solders quite as well as the Chrysocolla (Silicious Malachite); and some even suspect both to be of the same nature, as they are certainly both exactly alike in colour. Chrysocolla, however, is found plentifully both in gold-mines, and still more so in copper-mines, as in those at Stobæ. But the Emerald, on the contrary, is rare, as we have already observed; and it appears to be generated from the Jasper,† for it is said that once there was found in Cyprus a stone

* Compare this with the discovery at Tivoli mentioned under Amazon-stone.

† This explains the meaning of the comparison (Apoc. xxi. 11) of the gem illuminating the New Jerusalem "to a most precious stone," *ὡς λίθος ἰάσμιος κρυσταλλίνος* : "i. e. one combining the Jasper's green with the Crystal's lustre—an exact description of a true Emerald.

of which the one half was Emerald, the other half Jasper,* as being not completely transformed as yet by the action of the fluid. There is a peculiar method of working up this stone so as to give it lustre, for in the native state it has no brilliancy."

It is plain from the above that his Cyprian gem was merely the transparent Chrysocolla, still called the "Copper Emerald;" the remark that it could be used in soldering gold decides the question. But that kind qualified as "rare and small in size" was as indubitably the genuine one, for the Egyptian mine of the true Emerald had been worked ages before his times.

Pliny (xxxvii. 16) gives a long list of the various species of the Smaragdus, to the number of twelve, and of the localities furnishing each kind. The greatest part of these, the description of which he quotes from *earlier* writers, are evidently nothing more than calcedonies tinged green, or else carbonates of copper of different shades: a distinction must be made where he speaks from his own observation. First in the list he places the Scythian, "the best of all on account of its depth of colour and freedom from flaws (nullis major austeritas aut minus vitii), and as superior to other Emeralds as the Emerald itself to other gems." Their extreme hardness prevented their being engraved. All these characters, but especially the last, indicate this gem as the Green Ruby, a very rare variety of the Precious Corundum, and which indeed ought rather

* Doubtless a crystal of transparent Chrysocolla springing from a piece of green Malachite. Here we have the germ of the once popular name of "Root of Emerald," and "Radice di Smeraldo," for the Plasma: the latter being supposed to be the matrix, of cognate but baser nature, whence sprung the refined, purer, precious Emerald. This doctrine as to their generation held good for all the rest as I have noticed in the case of the Balais.

to be called a Green Sapphire. A specimen of large size, belonging to the (original) Hope Collection, once seen by me, exactly coincided with Pliny's description, its character being the darkest green, aptly designated by the term "austeritas," but far from pleasing; and its freedom from flaws, as contrasted with a true Emerald of the same magnitude, was particularly striking. For no precious stone is more liable to defects than the latter; "an Emerald without a flaw" is a proverb for an unattainable perfection, even the smallest Peruvian Emerald when cut will show one or more flaws within its substance: indeed their total absence is in itself enough to excite suspicion that the gem is merely a glass imitation; for no other precious stone can be more exactly counterfeited, nay, surpassed by a paste.

It must not, however, be forgotten that the old jewellers, like De Boot (ii. 52), describe their "Oriental" Emerald ("brought from the East Indies, but where found, not known")* as both far harder and far deeper in colour, and of a clearer substance than the Peruvian; moreover, as always small in size, rarely equalling a hazel-nut.† The Ural and Altai mountains have of late years furnished true Emeralds of the finest quality; the Scythian of Pliny may perhaps have been derived from that very source, brought down by the barbarian goldseekers in those regions (the Arimaspi)

* Garcias ab Horta says of the Indian stone: "It is more rare and valuable than the Diamond, and its native place is *hardly* known; inasmuch as no fragments of it are left, but even these, on account of their rarity, are carried off by the merchants." Chardin, however, notices that in his time (1680) Emeralds were regularly brought from Golconda, on the Coromandel coast. In the tariff of Sev. Alexander the Smaragdus is classed with the Adamas amongst the Indian exports; paying a duty of 12½ per cent.

† The practical De Laet declares that the Oriental sort is as hard as the *Sapphire*; proof positive what stone then passed by the name; next in hardness were the Brazilian (the *Tourmaline*): and the softest of all were the Peruvian.

to the Greek colonies lying around the Black Sea, or to the Persians on the Caspian. The epithet "Scythian" is generally used by Martial to designate the most precious sort.

"Indos Sardonychæ, Smaragdus *Scythas*."

And again in a very remarkable passage describing the plunder of a palace of the Dacian Decebalus, he alludes to his gold-plate (a most unlooked-for article to be found in the possession of a barbarian prince), inlaid with such stones which he must have procured through his Tartar allies (xii. 15).

"Quidquid Parrhasia nitebat aula
Donatum est oculis deisque nostris.
Miratur *Scythicæ* virantis auri
Flammæ Jupiter; et stupet superbi
Regis delicias gravesque luxus;
Hæc sunt pocula quæ decent Tonantem."

Next in value, as well as in the locality of their origin, were the Bactrian, found, it was said, in the crevices of the rocks during the prevalence of the Etesian winds: "for then especially did they sparkle in the ground when those winds had swept away the sands." These, however, were much smaller than the Scythian sort. Dionysius Periegetes describes the Indians as gathering both "verdant Beryls" and grass-green Jaspers out of the gravel of their torrents; apparently including Emeralds under the former designation, for nowhere does he mention the "*Smaragdus*."

The Egyptian held the third rank. Pliny notices nothing more of them than their extreme *hardness*, equal to that of the Scythian: these were extracted from the rocks round about Coptos, in the Thebaid. They are not to be confounded with the Ethiopian, found, according to Juba, twenty-five days' journey (which would make 500

miles according to caravan computation) from Coptos, which were admired for their brilliant green, though not usually clear, nor of the same tint throughout: "*acriter virides, sed non facile puri aut concolores.*"

The two mines last mentioned, the Coptic and the Ethiopian, doubtless furnished their chief supply of the true Emerald to the Romans, as they did even to the Egyptian Caliphs. Extensive traces of these workings are still to be discovered under Mount Zubara ("the Mountain of Emeralds"), first pointed out by M. Caillaud. His report stimulated Mohammed Ali to reopen the shafts: he had fifty miners employed there when Belzoni visited that region in quest of the ancient Berenice, but their researches had been totally unsuccessful. Belzoni considered that the veins had been quite worked out by the ancients, the vast extent of whose explorations was still attested by the mounds of rubbish covering the ground about the village Sakyat, the former Senskia, as existing inscriptions prove. Heliodorus also (*Æth.* ii. 32) speaks of the Emerald mines as lying in the debatable ground between Egypt and Ethiopia: his introduction of the subject into his romance shows that they were still of importance in the 4th century.* From these Sakyat workings Sir G. Wilkinson

* Mohammed Ben Mansur, in the thirteenth century, describes the Emerald mines as situated on the borders of the land of the Negroes, and yet belonging to the kingdom of Egypt, "where they are dug up out of Tale, and also in red earth." The soapy-green kind was found also in the Hedjaz, and therefore was called the Arabian. De Laet thinks the same region continued to supply Emeralds as late as the 17th century: "a very experienced jeweller having assured me that they were then brought secretly to Cairo for sale by the 'Ethiopiens,' and that he himself had bought some from a countryman outside the town (who thereupon immediately vanished), a proof that they could not have been brought from India." They may, however, have been obtained from plundering the mummies. Chardin affords a curious testimony to the old belief by his mention that the Persians

brought away several specimens of the gem in its quartz matrix, now exhibited in the mineralogical department of the British Museum. They are indeed of a bad, pale colour, and very foul, yet incontestably true Emeralds. However, it was not likely that a casual visitor could obtain anything but the refuse of the ancient miners; and a scientific exploration of the locality might produce stones equal in quality to those Emeralds of Imperial times, hereafter to be noticed.

"All the other eight species," says Pliny, "are found in copper-mines." We may therefore, on that ground alone, set them down for Prases, Malachites, perhaps the Green Turquois, &c., without the trouble of farther investigation. The best amongst these was the Cyprian, "the excellence of which lies in their colour, which was neither transparent nor diluted, but oily and liquid; and in whatever way it be viewed, resembles the clearest sea-water, so as to be equally transparent and lustrous: that is to say, sending out its colour, and admitting the eye" ("pariterque ut transeat et niteat: hoc est ut colorem expellat, aciem recipiat"). There are certain Prases occasionally met with amongst antique gems, which, from the extraordinary richness and brightness of their green, can with difficulty be distinguished by the eye alone from Peruvian Emeralds. There can be little doubt these are the gems Pliny here describes. "It is said that the tomb of Hermias, a prince of that island, which stood on the coast near the tunny-fishery, was surmounted by a marble lion, the eyes of which were made of these Emeralds [a proof of their large size and little value], and shot forth such lustre upon the sea as to scare away the fish; nor could the cause for a long called the first class Emeralds *Zmeroud Mierai* or *Zuani*, "Emerald of Egypt" or "Syene," the second class "the old Emerald," the third (Peruvian) "the new." But he adds, though the first were certainly fine and lustrous, yet he had seen American quite equal to them. Their asserted *superior hardness* he was unable to test.

time be discovered, until the gems in the eyes were changed." Curiously enough a marble lion was recently brought to the British Museum from Onidos, the pupils of whose eyes were deeply hollowed out, as if for the reception of some gem of an appropriate colour. Democritus seems to have had in view the Turquoise when he "classed in this family (as Pliny guardedly expresses it) the Hermisean* and the Persian kinds: the former, globose and fatty (ex tumescentes pinguitur); the Persian not indeed transparent, but of an agreeable equal colour, filling the sight, though not suffering it to penetrate them, like the eyes of cats and panthers, for they, too, shine, but are not transparent. These same Persian stones look dull in the sunshine, but grow bright in the shade, and show themselves from a greater distance than the other sorts." Their great defect, and one common to all the latter class, was their exhibiting a tinge of the colour of gall or of fresh oil (acris olei). In the sunshine they were bright and pure, but *not green*. Again he remarks (what can only apply to the Turquoise) a peculiar defect in this class, that their green hue fades away with time, and that they are injured by exposure to the sun (which latter agent speedily blanches the Turquoise, even that "de la vieille roche"). As for his Median kind, there can be no doubt it was nothing but Malachite, for "these stones exhibit a very deep degree of green, and sometimes of the Lapis-lazuli colour. They are of a wavy pattern, and contain images of different objects, as, for instance, of poppies or birds, whelps, feathers, hairs, and such like things. Such as are not perfectly green are improved by steeping in wine and oil."† This species

* Ezechiel makes Syria occupy the fairs of Tyre with "Emerald, purple, and brodered-work, agate and coral." Can he have in view the Turquoise still worked for at the foot of Mount Sinai?

† The very remark Ben Mansur makes concerning the Malachite, doubtless a traditionary process for its improvement in tint.

exceeded all others in magnitude. Juba stated that stones like the Median were found plentifully in Mount Taygetus in Laconia, and also in Sicily.

The supply of the Smaragdi from Chalcedon (mentioned by Theophrastus) had ceased in Pliny's times in consequence of the failure of the copper-mines there; the locality, however, was still known by the name Mons Smaragdites: "but," adds he, "they were always of little value, and very small. They were brittle, and of a changeable colour, like the green feathers in the tails of peacocks, or on pigeons' necks, shining more or less according to the angle at which they were held; yet at the same time full of veins and of scales." All which shows, as before explained, they were only crystals of transparent Chrysocolla.* Compare the manner in which Ben Mansur divides the Emerald into seven classes, according to the colour: 1. The grass-green, of a beautiful clear colour like the little worm often seen in the grass. 2. The Basil-green. 3. The Leaf-green. 4. The Verdigris-green. 5. The Euphorbium-green. 6. The Myrtle-green. 7. The Soap-green. (This last seems to be the bad, pale, opaque quality resembling frozen oil.)

But, when Pliny is speaking for himself, the case is very different; the Smaragdus of Nero's age must be restricted to the true Emerald, perhaps including the Green Ruby. His remark, that "such Emeralds as have a plain surface reflect objects like a mirror," is singularly correct, and attests his accurate acquaintance with the peculiar properties of the gem. For a large flat Emerald, if held so as to reflect the light, will assume the exact appearance of

* Corsi's explanation that this was our Amazon-stone, founded upon the specified opalescence of the former, its "pigeon's-neck reflexions" is controverted by the also remarked property of fusibility, a proof of its being merely a form of copper-oxide.

being silvered at the back: its green disappears when its plane is brought to a certain angle with the incident ray; and it will seem exactly like a fragment of looking-glass in the same position. This singular change is not observable in any other coloured stone. Similarly Ben Mansur lays down that the distinction between the Emerald and the other stones resembling it, viz., the Jasper, the Green Laal (Spinel), and the Mina (Green Glass), lies in the *polish*. And again, "the first-class stone, *Saikhali*, the clear, polished, reflects whatever is held before it like polished steel."*

The huge Smaragdi mentioned (under reservation) by Theophrastus, as standing in the Egyptian and Syrian temples, were made, it is possible, of pieces of Green Jasper, or of the Oriental Amazon-stone (MITHBAX), artfully cemented together, or perhaps of glass. But the dimensions of such obelisks and columns must nevertheless have been wonderfully magnified by the reporters. Apion, in the reign of Tiberius, had mentioned a Colossus of Serapis as then standing in the Labyrinth, and nine cubits high, made out of Smaragdus. The Alexandrians were ever famous for their glass-manufacture, so that such figures, although their size has doubtless been enormously exaggerated, may actually have been executed in some vitreous composition, represented to the credulous visitor as the real Emerald. Such, in truth, was the case with the famous Sacro Catino of the Cathedral of Genoa (a patera 14 inches wide by 5 deep), traditionally believed to have been used by Christ at the institution of the Lord's Supper. According to Erasmus Stella (1517), the Genoese had a

* The lustre of the Emerald even in the palest specimens is indeed so peculiar as completely to prevent its ever being mistaken for any other stone of the same tint. Some old mineralogists have aptly compared it to the sheen of the surface of olive-oil; for example Marbodius: "*Smaragdus virens nimum dat lumen oleaginum.*"

plausible story accounting to the sceptical few for the presence of a vessel of such inestimable cost upon the humble table where the Passover was celebrated. It figured at the time among the banqueting-plate of King Herod, and had been forwarded to Jerusalem, whither it was his intention to come from Galilee to keep the Feast: but the King having, by Divine interposition, altered his mind, his dinner-service was unceremoniously borrowed for their Master's use by the Disciples. Gesner relates that a monastery near Lyons still (in 1565) boasted of an opposition Emerald dish, according to them the only authentic one, but much smaller and far less famed than the relic at Genoa. This celebrated dish had been assigned to the Republic at the capture of Cesarea in 1101, as an equivalent for a large sum of money due from the Crusaders. The State pawned it in 1319 for 1200 marcs of gold (38,400*l.*), and *redeemed it again*, a satisfactory evidence of their belief in the reality of the material as well as in its sanctity. It was a large *patera* of a transparent rich green substance, believed through all those ages to be a single Emerald of incalculable value, but which the investigating incredulity of the French, when masters of the city, in 1800, at length tested, and found to be merely glass.* Similarly the noted Emerald, weighing 29 pounds, of the Abbey Richenau, near Costanz, the gift of Charlemagne, turned out, says Raspe, when critically examined in the last century, a counterfeit of the same kind. Such also was, without doubt, the renowned "Table of Solomon," found by the Arab invaders in the Gothic treasury at Toledo, which Elmacin

* Agricola mentions, besides these two, one "more than eight inches long" in the chapel of St. Wenceslaus, at Prague, and a fourth somewhat larger at Magdeburg, set in the gold tower containing the Host, traditionally believed to be the handle of Otho I.'s knife, being perforated as if for such a purpose.

describes as a table of considerable size, one single piece of solid Emerald, encircled with three rows of fine pearls, supported upon 365 feet of gems and massy gold, and estimated at the price of 500,000 aurei.*

It may, however, be stated here that the antique glass Emeralds possess colour, lustre, and hardness in a degree far superior to the modern pastes. One found at Rome, which had been re-cut and set in a gold ring, eclipsed in beauty almost every stone of the kind ever seen by me: in fact, it is a usual practice there amongst the gem dealers, on obtaining a fine green paste, to get it cut and faceted for a ring-stone, and as such to obtain an emerald's price for it from the unwary dilettante. The Cingalese anxiously seek after the thick bottoms of our wine-bottles, out of which they cut very fine Emeralds, which they dispose of, much to their own profit, to the "steamboat gentlemen," exactly as Garcias ab Horta, physician to the Viceroy of Goa, describes the Hindoos at Balagate and Bisnagar as doing for the benefit of the Portuguese, three centuries ago. The Brighton Emeralds, so largely purchased by visitors, are of similar origin: the broken bottles thrown purposely into the sea by the lapidaries of the place are, through the attrition of the shingle, speedily converted into the form of natural pebbles, and return a lucrative harvest to these ingenious artists, who truly "sow the sands," but not in vain.

* This had formed part of Alaric's Roman spoils, subsequently distributed between the capitals of the newly-formed Gothic kingdoms of Aquitaine and Spain. Procopius (B. G. i. p. 343) says that the Franks eagerly pressed the siege of Narbonne in the belief that the city contained the royal treasures carried off by Alaric from the sack of Rome, amongst which were the vessels of Solomon made out of Emeralds. They had been deposited, with the other spoils of the Sanctuary of Jerusalem, by Vespasian in his newly built Temple of Concord.

Nero, who was extremely shortsighted* ("Neroni oculi hebetes, nisi cum ad prope admota conniveret," Pliny xi. 54), used to view the combats of gladiators in the arena through an Emerald (*smaragdo spectabat*). This stone must have been hollowed out at the back, and thus have acted as a concave lens in assisting his sight to distinguish clearly what was going on so far below the imperial seat. But this virtue at the time was certainly ascribed to the material, not to the form of the stone, for the looking upon an Emerald was by the ancients considered extremely beneficial to the sight—a notion that prevailed as early as the times of Theophrastus, who states that people wore Emeralds set in their rings for this very purpose.† Had it not been for this confusion of ideas, the invention of spectacles, at least for myopes, would have been anticipated by more than a thousand years. Some commentators (to begin with Marbodius) have ignorantly supposed that Nero employed a flat "table" Emerald as a mirror to reflect the distant combat: such writers could never themselves have suffered from shortsightedness, or they would have been well aware that to an eye so formed the reflection of a distant scene would be but obscurity doubly obscured. But had the Emerald been employed on these occasions merely as a mirror, Pliny would have used the expression "*in smaragdo*,"‡ not "*smaragdo*" simply, which last can only

* Any one that has examined the portraits of this emperor on a gem or a well-preserved medal will at once discover from the extraordinary size and fulness of his eyes how very short-sighted he must have been. Curiously enough, myopia is still in Italy almost a distinctive peculiarity of aristocratic birth.

† Pliny adds that gem-engravers were accustomed to refresh their wearied eyes, after the excessive straining required in their work, by gazing for some minutes upon an Emerald kept at hand for that use.

‡ Jan however gives "*in smaragdo*" as the true reading, and this indeed Marbodius must have found in his own copy of Pliny, for he

signify "by the aid of an Emerald." The supposition of the concave lens is supported by the puzzling remark of Pliny a few lines before, "they are usually concave, so as to concentrate the sight" (ut visum colligant). And Solinus actually describes his smaragdi (xx.) as both convex and concave in form; and the test of their goodness: "if they be transparent, if when globose they colour neighbouring objects by the reflection of their lustre, or when concave image back the faces of those looking into them."*

Epiphanius informs us that, even down to his times (the close of the fourth century), the name *Neronian* was given to a kind of Emerald particularly austere and green in tint, transparent, and lustrous. This epithet arose from a discovery attributed either to Nero or Domitian, of a recipe for improving the colour of the gem, by macerating it in oil left standing in a copper vessel until it had imbibed sufficient verdigris to turn it green. By others, this

makes Nero use his Emerald as a mirror. In fact Barbot completely overthrows my explanation in the text by stating that the Emerald, though cut ever so thin, will not allow distant objects to be seen through it; which, if a fact, settles the reading of itself. That a gem set in a ring can serve for a mirror appears from an anecdote related by Camerarius of his patron Maximilian II. On a visit of that Emperor to Ratisbon the city had presented him with a gold cup filled with ducats. Whilst all were engrossed in looking out of the windows of the reception-room at a grand show exhibited in the street below, in honour of the occasion, the Emperor detected "by the reflexion in the stone of a ring upon his finger" one of the courtiers profiting by it to slip unobserved to the cup, still standing on the table, and help himself to a handful of its contents.

* One would conclude from these expressions that the Romans hollowed out the back of the Emerald in order to give it lustre, as we know was their frequent practice with the Carbuncle and the Guarnaccino. A very fine Prasa, which may have passed for the superior gem, thus treated, has come under my notice: the intaglio is Europe borne off on the Bull (Rhodes).

method of tinging the stone was attributed to an ancient painter or gem-engraver, the namesake of the Emperor.*

This tradition deserves more attention than it has obtained. An opinion has been recently advanced that the New Granada Emerald, the finest of the species, owes the depth of its green to a saturation with animal matter derived from the organic remains that fill the limestone-rock, its actual matrix. Minerals tinged by an admixture of chrome do not lose their colour when heated, which the Emerald does, a fact indicating a different source for its green than that generally received. To the support of this theory comes the belief of the old Peruvians, mentioned by Gar. de la Vega, that the Emerald ripened in its matrix as the fruit does upon its tree; being first colourless, and then gradually turning green, assuming its colour first at its corner that faces the rising sun.

The Hindoos of every age have greatly admired the Emerald, especially when formed into a pear-drop, pierced at the small end and worn as a pendant in the ear. They also employ it much in bracelets; and many a glorious gem of this species, as well as of the Sapphire, have they remorselessly sacrificed to the fashion by drilling a hole through its centre for the purpose of stringing it as a bead. One of the finest ever found was to be seen thus maltreated upon the arm of Runjeet Singh; and the largest and bluest Sapphire that has come under my own notice had been

* By the later Greeks and Latins "*Prasinus*" is used to distinguish the true Emerald; the old term *Smaragdus*, from the number of different species it had been applied to, having evidently been abandoned as too indefinite. *Prasinus* must not however be confounded with *Prasius*, always a common stone. That livery of the circus, ever the most popular of the four both with Cæsar and canaille, from Nero—in Juvenal's time, who hears the acclamations, "*eventum viridis quo colligo panni*"—down to Justinian, was appropriately given to the gem of gems.

similarly disfigured. Such gems, in order to be utilized in European jewelry, must be cut in two, the only means of getting rid of the unsightly perforation: and thus one gem of unparalleled magnitude is necessarily reduced into a pair of mere ordinary dimensions. Such has been the Indian custom from time immemorial, as appears from the description of Queen Persine's necklaces, thus poetically described by Heliodorus (*Æth.* ii. 30): "So saying, from a little pouch he wore under his arm-pit, he took out and showed me an astonishing lot of precious stones; for amongst them were Pearls as big as a small walnut, perfectly round, and of the most dazzling whiteness; Emeralds likewise and Sapphires; the former green like a meadow in the spring, but illuminated with a certain oily lustre; whilst the latter mimicked the colour of the shallow sea as it lies under the shadow of a precipitous rock, when it is slightly ruffled by the breeze, and casts a violet tinge upon the bottom." Tavernier notices that in his day every Hindoo who could afford it, wore in his ears a Ruby or an Emerald strung between two Pearls. So composed appears the *triple* ear-drop seen in the portraits of the Sassanian queens, and which may supply another explanation of the disputed meaning of the *τρίγλῳρα*, with which Homer, as we have seen, adorns the ears of Juno.

Pliny, with his accustomed happy brevity, thus condenses the long rambling legend narrated by Herodotus concerning the most renowned gem of all history:—"The estimation of precious stones had grown into so mighty a passion that Polyocrates the Samian, tyrant of the isles and coasts of Asia Minor, was persuaded that in the voluntary loss of a single gem would lie a sufficient atonement for his own prosperity, which even he, the prosperous one himself, owned was too great to last; and that, if he wished to balance accounts with the fickleness of Fortune, he

could amply buy off her spite by suffering this single grief, being fatigued with uninterrupted happiness. Putting out therefore to sea, he threw in his signet-ring; but a fish of remarkable size, born for the royal table, snapped it up for food, in order to give the omen, and restored it to the owner in his kitchen, from the hand of that Fortune who was plotting his destruction." Amasis, the wise Egyptian king, who had counselled this mode of atonement, on hearing of this last proof of the pertinacity of Polyocrates' good luck, solemnly renounced his alliance, being persuaded that he would have most signally to pay for all in the end: as the event soon proved, for having fallen into the hands of Orostes the Persian, he was impaled.

There can be little doubt this tale of "the Fish and the Ring" is true; indeed, it is too incredible for a fiction. Fish, especially the mackerel, greedily swallow any glittering object dropped into the sea (a bit of *tin* being the best bait for the latter); and within my own recollection, one when opened was found to contain a wedding-ring.

That this stone was the true Emerald is evident from the enormous value attached to it. With the Greeks it long continued the established medium for the signet of the prince. This may be deduced from Pliny's words (xxxvii. 4):—"It is clear that in the times of Ismenias even the Emerald used to be engraved. This opinion is confirmed by an order of Alexander the Great, forbidding any other artist, except Pyrgoteles, doubtless the most eminent in the profession, to engrave his portrait upon *this gem*." And again we may draw the same conclusion from an anecdote Plutarch tells of Lucullus (cap. iii.) to illustrate his disinterestedness. Being sent by Sulla on a mission to King Ptolemy Lathyrus, he not merely refused all the splendid presents offered him, amounting in value to eighty talents (16,000*l.*), but even received of his table

allowance no more than was absolutely necessary for his maintenance; and when the King attended him down to his ship, as he was about to return to Rome, and pressed upon his acceptance a very precious Emerald, set in gold (for a ring), he declined this also until Ptolemy made him observe it was engraved with his own portrait, whereupon, fearing his refusal should be considered a mark of personal ill-will (his mission having been unsuccessful), he at last accepted the ring as a keepsake.

This notice of royal Emeralds may be aptly concluded with an unparalleled specimen of Oriental caprice and extravagance. It is a finger-ring cut out of a solid piece of Emerald of remarkably pure quality; with two Emerald drops, and two collets set with rose Diamonds, and Ruby borders in Oriental mountings; formerly belonging to Jehanghir, son of Akbar, Emperor of Delhi, whose name is engraved on the ring. Diameter, $1\frac{1}{2} \times 1\frac{1}{2}$ in. This ring was presented by Shah Soojah to the East India Company, and was purchased by the late Lord Auckland, when Governor-General of India. Now in the possession of the Hon. Miss Eden.

In Pliny's age, such was the estimation in which the Emerald was held on account of its beauty and costliness, that, "by the common consent of mankind, the stone was spared, being not allowed to be engraved." He quotes, indeed, from some early Greek author (xxxvii. 3) a story to illustrate the (professional) vanity of the musician Ismenias, in Alexander's reign, who, having heard of a Smaragdus engraved with an Amymone, on sale in Cyprus, at the price of six gold pieces, sent for it; and when his agent, having by chaffering reduced the price to four, brought back the ring and the surplus, pretended to take offence at the insult offered the gem's dignity by this beating down of the price. But the locality, the age, and the comparatively

trifling cost of the stone, all go to prove that nothing more than a Prase is here understood by the term *Smaragdus*. Pliny's first statement, indeed, is fully borne out by those rings that have come down to us intact from Roman times, which invariably present their Emeralds unengraved and, for the most part, in their native prismatic form, with but a slight polish given to the surface; of such, the Devonshire Collection contains no less than three; indeed they are of pretty frequent occurrence. But true Emeralds, with really antique intagli upon them, are amongst the rarest of the rare, and appear scarcely one of them referable to an earlier date than the luxurious age of Hadrian, although one of the most remarkable of the Mertens gems was an *Etruscan* Scarabeus, its subject a charioteer in a *triga* seen in front face, formed out of a poor but unmistakeable Emerald of tolerable magnitude. In fact, the best examples, both for quality of stone and the style of art, examined by myself, presented, one, this Emperor's head; the other, that of his consort Sabina; a third, the heads of both facing each other. It is curious so large a proportion of the works in so rare a material should belong to this prince's reign. Perhaps his love for Egyptian ideas, and long sojourn in that country, may have stimulated the workings of the Zubara mines, the main source of the supply. The transient revival of the Egyptian religion, due to his patronage, has also produced a miracle of the glyptic art, embodying one of its ideas: an intaglio head of the Solar Lion, the Alexandrian Oneph, giving in its impression a lion's head standing out in full relief, with gaping jaws full of life and fury; the stone, moreover, of the finest colour, purity, and lustre, and in itself of considerable intrinsic value (Fould, *the late*). The Devonshire Parure also exhibits (Bandeau, No. 11) a large and beautiful Emerald cut into a Gorgon's head in high relief,

which has every mark of being an antique work of the same period: in fact, it is hardly possible to conceive a modern hand venturing to convert into a medium for art an ornamental stone so costly as this unusually large and pure example. The baser specimens from the Zubara mines—cloudy, full of flaws, almost opaque, aptly compared by Ben Mansur to green soap—were in high favour for amulets. Pliny quotes the impudent pretence of the Magi, "made in contempt and ridicule of mankind," that Emeralds engraved with figures of eagles or beetles possessed mighty virtues in conciliating the favour of princes, and in averting tempests. One of the most singular of these amulets (formerly amongst the Praun Gems) displayed a head of Jupiter within a coiled serpent resting upon a crocodile, surrounded by emblems of the planets; and bearing much analogy to those Alexandrian medals of Antoninus Pius, the devices on which are supposed to indicate the commencement of a Sothiac Period.* The same Cabinet also possessed a Gnostic legend of several lines upon a similar material.

Wonderful specimens of the skill and ingenuity of the Mexican lapidary were the famous Five Emeralds, the wedding present of Cortez to his bride in 1529. "The first was in the form of a rose, the second in that of a horn, the third like a fish with eyes of gold, the fourth was like a little bell with a fine Pearl for the tongue, and on the rim was the inscription in Spanish, 'Blessed is he who created thee.' The fifth, which was the most valuable, was a small cup with a foot of gold, and with four little chains of the same metal attached to a large Pearl as a button. The edge of the cup was of gold, on which was engraved the Latin sentence—'inter natos mulierum non surrexit major.'"

* That is, the opening of the "Great Year," and the epoch of the regeneration of all things.

(Gomara, Chron. c. 184.) For one of these gems some Genoese merchants at Seville had offered Cortez 40,000 ducats. The queen of Charles V. had previously intimated her desire of acquiring some of these precious curiosities: and the disappointment she experienced, through the preference shown by the adventurer for his bride, made her his enemy for life, the effects of which she did not fail to make him experience on subsequent occasions.* Another monster Emerald was that accompanying the third letter of Cortez to the Emperor, in May, 1525; it was of fine quality, four-sided, and tapering to a point like a pyramid, as large as the palm of the hand at the base.

The largest *Peruvian* Emerald obtained at the Conquest was the one that fell into Pizarro's hands on his first entrance into the province of Coaque, the region of the "Esmeraldas." A large number of those made prize of on the same occasion were smashed by the soldiers with hammers, the test of the true Emerald being its infrangibility according to their chaplain, Reginaldo de Pedianza. The Emeralds not supporting this test were considered mere pastes, and reckoned valueless; and consequently were collected without difficulty for himself by the astute and more knowing friar.

Pedro d'Aragona, an early Viceroy of Peru, dedicated to Our Lady of Loretto a mass of quartz studded with numerous crystals of the finest-coloured Emeralds, some an inch in diameter ($\cdot 027$ m.) So says Caire, who had examined it.

Garcilasso de la Vega relates that the chief deity worshipped in the city of Manta (Peru) was an Emerald nearly

* The whole set was lost in his shipwreck upon the disastrous expedition against Algiers in 1541, "which made the misfortune fall more heavily upon Cortez than on any one else besides the emperor."

as large as an ostrich-egg. The priests zealously inculcated upon her worshippers the belief that the most acceptable offerings to this goddess, *Esmeralda*, were her own children in the shape of minor Emeralds: whereof they themselves took good care. Upon the conquest, these children fell a prize to Alvarado and to Vega, the historian's patron; who in this case also, like the followers of Cortez with their Mexican spoils, destroyed many splendid Emeralds by subjecting them to the test of the hammer, as Garcilasso records. But the Great Mother disappeared for ever; neither could any of her devotees be brought, either by threats or promises, to disclose her hiding-place.

These wondrous Peruvian mines have long since ceased to be productive; of late years the chief supply has been drawn from the Muzo mine, near Santa Fè de Bogota, in New Granada. These workings used to be let by the Republic for a term, at the rate of 8000*l.* per year; but at the last auction there were no bidders for the lease. But a person of great experience assures me that the true cause of the failure in the production of all precious stones, including Diamonds, in South America, is not so much the exhaustion of the mines as the diversion of capital and labour to the more profitable gold-fields.

The generic name *Smaragdus* is undoubtedly the Greek form of the Persian "*Samarrud*," or "*Zmeroud*," it being the invariable rule that all the productions of the East retained amongst the ancients their Oriental names, more or less modified (in order to give them a Greek significance) according to the greater or less degree of harshness in their original forms. In this way we have "*Margarita*" from "*Merwerid*," "*Hyacinthus*" from "*Jacut*," and "*Sardius*" from "*Sered*," and, more curiously, "*Almas*" appearing as "*Adamas*," with the implied idea of invincibility, ac-

cording to the same law that converted "Alfas" into "Elephas," "the big stag," and "Septagen" into "Psittacus," "the big jay."*

Emeralds were employed in preference to all other gems by the Persians for adorning those jewelled goblets which owed their origin to their luxurious pomp. Even Theophrastus (35) describes them (including perhaps the Turquois) as the gems used for the *Λιθοκόλλητα*, and collected by horsemen in the deserts; which Pliny, going a little more into details, informs us were the Bactrian sort. Such a mode of ornamentation was long kept up in Persia. Ben Mansur says, "Several bits of Emerald united together upon one surface, by means of *mina*, are called Astar." This form of extravagance flourished amongst the Romans: Pliny indignantly exclaims, "We weave cups out of Emeralds," i. e., the stones were connected together into a continuous whole by means of a gold skeleton frame, like the Byzantine imitations of the same in translucent enamel; and Martial talks of a single cup robbing many a finger of its wonted decoration (xiv. 109):—

"Gemmatum Scythicis ut luceat ignibus aurum
Adspice, quot digitos exuit iste calix!"

Hence the tradition, mentioned by Procopius, that Solomon's sacred vessels were of this character, which in its turn gave birth to the legend of the Sacro Catino.

What was the true nature of such "Prasini" vases may be guessed from Dumarsan's description of one descending from Roman times and preserved in the Treasury of Saint Denys: "Une autre gondole (aut *scaphium*) de *crysolite*, très exquise, couleur de verd de mer, le pied et la bordure

* Long ago Chardin aptly observed:—"It is natural that, the East being the mine or source of the precious stones, their names likewise should have come from thence.

garnis d'or et enrichis de saphirs, grénats, prismes d'esméraudes, et de soixante et dix perles orientales. Cette pièce est grandement estimée par ceux qui se connoissent en pierres. Elle fut jadis engagée par le roy Louis le Gros (1108-1137) et desengagée de son consentement par l'Abbé Suger, qui en paya 60 marcs d'argent, grande somme pour ces temps-là. Elle a esté faite ou du moins garnie par Saint Eloy, comme le mesme Suger asseure au livre de ses gestes:—'Quod vas (dit il, parlant de cette gondole) tam pro pretiosa lapidis qualitate, quam integra sui quantitate, mirificum, inclusorio Sancti Eligii opere constat esse ornatum; quod omnium artificum judicio pretiosissimum æstimatur.'

The existence of this *gondole*, as well as the Vienna patera (MURRHINA), if really in stone, explains what Pliny means by his Chrysoprasus, "more near gold in tint than the Topazius," sufficiently large to permit *cymbia*, boat-shaped vessels, to be cut out of it. Again, I have seen vases, by no means minute, brought from China carved in a green translucent material, of the exact shade of the Peridot, the true nature of which is still a question amongst mineralogists, some supposing it to be a variety of Felspar, others the true Chrysoprase.

Treatises were extant in Pliny's time (75), showing how false Emeralds might be made by staining rock-crystal, as well as other gems—a fraud which he terms the most lucrative in the world. This was probably done by plunging the heated crystal into verdigris dissolved in turpentine, according to the modern plan to be described under *Rubaca*. The crystal becomes full of minute cracks, into which the colouring fluid insinuates itself, and tinges the entire substance. The great art is so to regulate the operation that these cracks do not become too conspicuous upon the surface. Upon this point Seneca has the follow-

ing curious passage (Ep. 90, 33):—"The same Democritus discovered the method of softening ivory; and how a pebble by means of *boiling* can be transformed into an *Emerald*, by which same process (*coctura*) artificial gems continue to be stained at present." This looks like an allusion to the staining of crystal, "*calculus*" being usually applied to a white quartz pebble, such as Pliny notices as ingredients in glass-making.

De Boot (II. 53) runs up a long list of the virtues of the Emerald, as then firmly believed in by everybody, himself included—Worn in a ring it was a sure preservative against epilepsy (as Marbodus also teaches upon the authority of Aristotle), cured dysentery, and preserved the chastity of the wearer, or else betrayed and punished its violation by immediately flying into pieces.* The imperial physician gives a recipe for preparing the "*Tinctura Smaragdi*"—a most efficacious medicine in dysentery, epilepsy, and malignant fevers: "Pound the Emerald in an iron mortar, sift the powder through muslin, then cover it with *spiritus urine* (*sal volatile*): the spirit must be distilled off, leaving the powder of a grey colour, but which will communicate that of the emerald to spirits of wine."

The value of this stone in the middle ages was enormous. Fran. Maria, prince of Urbino, paid 113 gold pieces for an Oriental Emerald weighing no more than two carats. Cellini puts it at 400 gold *soudi* the carat, or at four times

* "*Agricola, si pendens cutem tangat illius qui actum venereum exercet disrupti existimat. Id si in quovis actu legitimo vel illegitimo contingat, necesse est vel motum vel halitum seminalem in Smaragdum agere, nisi metaphysica facultas illi insideat aliqua, quæ nulla ratione investigari possit.*" Ruesus adds "*Jam vero apud omnes constat lapidem hunc rerum venerearum impatientem esse. Ut etiam Albertus ille Magnus asseverare non dubitavit regi Hungariæ cum uxore rem habenti Smaragdum quam in anulo portabat in tres divisam fuisse partes.*"

his estimation of the Diamond. Linschotanus, in his '*Iter Indiæ Orientalis*,' makes it worth one-seventh more than the latter stone. But fifty years later De Boot considers that, owing to the vast influx of the Peruvian kind, its then value could only fairly be reckoned as one fourth of that of the Diamond, thus exactly reversing Cellini's rule. But now again Cellini's valuation has suddenly been re-established through the total cessation of the supply from America, and a perfect Emerald commands the highest price of all precious stones in the London market. De Laet cites from the notes of "a very eminent jeweller" of the preceding century that in 1540 the Emerald (the oriental) was in as much esteem amongst the nobility as the Diamond itself; also that the largest that had ever come to the knowledge of the writer was of 25 carats weight; adding that this particular stone was in 1570 valued at 20,000 crowns; which was merely one-third of what it would have fetched at the first-named date.

The Tourmaline, notwithstanding the general opinion as to its very recent introduction into Europe, had been long known in De Laet's times. He describes it as the Brazilian Emerald, of a dark-green shade as if stained with soot, and disagreeable to the eye. The crystals were cylindrical, (prismatical?) with three equal sides, sometimes striated as if done artificially. A mine of it had then lately been discovered at Santo Spirito, the ownership of which the Jesuits were claiming. In the previous generation these stones had been cut and worn like the precious Emerald, never, however, being priced higher than Garnets; but by that time they had gone entirely out of fashion.

JEWELRY OF THE ANCIENTS.

Or the most ancient goldsmith's-work on record, that masterpiece of the Olympian jeweller, the necklace wedding-gift of Venus to Harmonia, the mystic Nonnus has left penned the following elaborate description (*Dionys.* v. 173):—

“ With cunning hand the god a necklace wrought
And to a serpent's form his labour brought :
In full relief, embossed in living gold,
Her double head an amphibæna rolled,
And spurning venom from each twofold jaw
Seemed either way her tortuous folds to draw.
Whilst head with head aye striving to conjoin
She writhes in many a coil her body's starry twine :
Thus like the twofold neck, encircling round,
Its wavy back the artful collar wound.
Horrent with scales was seen each separate snake
Down to the navel ; thence but one they make ;
For at the hinge, so cared the smith divine,
In one huge ring is tied the weighty spine.
So glancing sideways with each quivering head
She seems to vomit out her hisses dread.
But where each mouth begins and where each ends
Modelled in gold erect an eagle stands ;
As cleaving the wide heaven himself he draws
From out the compass of the dragon-jaws :
On pinions four, conspicuous on high,
With wings quadruple doth he mount the sky :
On *one* a Jasper gleams with orange bright,
On *one* a Moonstone of a matchless white—
The gem that waxes whene'er the horned querc-
With wasting orb above the heavens is seen,

But waxes still when'er the Moon renewed—
 Pours from her horn the liquid silvery flood—
 Whilst the pale goddess from the Sun, her sire,
 Draws in like milk the self-begotten fire—
 Casts from the *third* the dawn-like Pearl its rays
 Whose charm the Red Sea's boiling surge allays;
 Whilst on the *fourth*, of round and bossy form,
 An Indian Agate pours its lustre warm,
 But where the viper-heads together bend
 Full wide their jaws the gaping mouths extend,
 As though with ravening fangs they eager strove,
 Caught in the midst, to seize the bird of Jove.
 From either head, set 'neath each threat'ning brow,
 Their lamp-like flame fierce-burning Rubies throw.—
 Mimicked in various stones there ocean spreads
 O'er which its hue the sea-green Emerald sheds,
 Which joined to a Crystal in one common home
 Pictures the darkening brine, the wave-tossed, bubbly, foam.
 Wrought on its face disport in golden sheen
 The sea-born flocks that rove the depths marine;
 Where many a plougher of the watery way,
 The bounding dolphin cuts the topmost spray,
 And in the midst where his companions sail
 With life-like frolic curves his lashing tail.
 There too of birds the parti-coloured choir
 With flapping wings in semblance strike the ear.
 Such was the gift whose curious art outvied
 Its gold and gems in all their priceless pride,
 That Cythereia, the young bride to deck,
 Midst the glad rites clasped round her virgin neck."

This picture is not a mere figment of the poet's fancy, but a paraphrase of some account, then extant, of a celebrated relic that was preserved far down into historic times. As the fatal bribe of Eriphyle it had been dedicated at Delphi by the avenger, Alcmaeon; and we have already seen how its fame and beauty saved it from the melting-pot to which the necessity of the Phocian chiefs consigned all the other donaria of previous ages. From the possession of the tyrant's wife it doubtless passed undamaged into the conqueror's hands, and was, as the nature of the case

demands, restored to its original shrine. The authenticity of the details in Nonnus appear from several considerations. Firstly, from his minuteness in this particular point, whilst he passes over all the other components of the bridal *trousseau* in the most vague and cursory terms. Secondly, from the very confusedness of his account, for he is evidently putting into verse a technical and detailed description the terms of which he was himself far from comprehending. Again, the entire character of the jewel, minutely correct if regarded as an archaic work, is totally diverse from that of the decorative art of the Lower Empire, and such as no poet of those times could possibly have devised by his unassisted imagination. Its whole design is Assyrian, for by extracting the sense of the flowery and intricate verses above cited, we discover its form to have been a *torques*, shaped like a double-headed serpent (precisely that seen on the neck of Darius in the Pompeian mosaic): the centre-ornament was an eagle having *four* wings, adjuncts unknown to Greek art, but typical of Assyrian—it was the Babylonian Lynx, the Hebrew Cherub—each wing set with a different gem; a Jasper, a Moonstone, an Indian Agate, a Pearl: having also a pendant composed of an Emerald and a Crystal surrounded by a framework of fishes and birds: the eyes of the serpents were of *Lychnis*, i. e. Spinel. The choice of these gems attests again the antiquity of the work; the Agate and Jasper ranking with the Pearl and the Ruby. A poet of the fourth century would have thought scorn of those then so vulgar gems, and would, like one of our day, have substituted for them the Diamond and the Opal, especially in the reputed handiwork of a god.

All the magnificent works in which the artist-goldsmiths of Asia, Greece, and Rome displayed their wondrous taste and skill, have utterly perished. Of their magnificence

we can form but an inadequate idea from the descriptions of history, but of their excellence in point of art the personal decorations, though of small intrinsic value, yielded to modern research by the Greek and Etruscan tombs suffice to give us an example. The sole relic that has escaped the barbarian despoiler of the lavish splendour of Imperial Rome is the Patère de Rennes, already described.

There exist, however, three monuments which exhibit the Roman art, though in its most degraded state, and as practised by foreign, semi-barbarian craftsmen; and these, both for their rarity and their historical interest, are well deserving of a particular description. They therefore shall be taken in chronological order.

HISPANO-GOTHIC CROWNS.

In the year 1858 some labourers employed in bringing under cultivation the site of a deserted cemetery at Fuente di Guerrazar, two leagues from Toledo, came upon a buried treasure consisting of eight crowns and coronets in gold adorned with gems, the intrinsic value of which is calculated at 2000*l*. The whole treasure-trove quickly found its way to Paris, where it was without any needless delay (or reference to ignorant *Trustees*) secured by the proper authorities for the Musée de Cluny, of which it now forms the most interesting feature, being ingeniously displayed to public inspection within a glass case, accessible on every side.

Of these the most important is the crown of King Receswinthus (A.D. 653), a broad circle of fine gold, eight inches in diameter, set with thirty uncommonly large Pearls, alternating with as many fine Sapphires. This band is edged with a border above and below, filled with a running pattern of Greek crosses of red pastes *cloisonnées* in gold.

From twenty-four little chains hang these letters of gold encrusted with pastes like the borders,

+ RECESVINTHVS REX OFFERET.

From the letters again are suspended twenty-four *pendeloques* in gold, and five Pearls, which support twenty-four pear-shaped Sapphires, forming a fringe all round the circumference. Lowest of all comes a very magnificent Latin cross of truly elegant design, four inches long, set with eight enormous Pearls* and six equally splendid Sapphires, and having three pendants from the arms and foot cut out of square pastes. In this cross the gems are set *à jour*; the back of their collets being filled in with a rose-ornament in filigree. The settings themselves are exquisite, the claws holding the stones being fleur-de-lys. This cross is the finest example in existence of ancient goldsmith's work.

The second crown, supposed to have been his queen's, is set with *Emeralds*, Sapphires, Opals, large Pearls (fifty-four in number), and has a fringe like the first, but of crystals† and pastes. It has a pendent cross also set with Sapphires, but which is quite plain in form and of small intrinsic value.

The others are much simpler, and embellished with but few and inferior stones; they were the coronets of contemporary counts and barons. Three of these coronets present a novelty in make; an open grating with gems set at each intersection of the bars; from each hangs a flat

* The Pearls are as big as ordinary cherries, the Sapphires of the best colour, those in the middle row as large as pigeons' eggs, all *cabochons*, the centre one very protuberant.

† I strongly suspect from their shape that some of these "crystals" are in reality rough diamonds: that stone could hardly have been omitted from this assemblage of all that was most precious amongst the spoils of Rome.

cross *pattée* jewelled, one of them bearing Sonnica's votive inscription. The remaining three are much lighter, and are simply ornamented with arcades in *repoussé* work in the common Byzantine style. The small diameter of the last six shows that they were not designed to be worn, but merely for votive offerings. The two principal crowns, however, open with hinges, and the queen's has a row of rings along the edge evidently serving for the adjustment of a lining. All have gold chains proceeding from a centre or hook for suspension. In the king's crown this centre is artistically cut out of a large crystal into the pattern of a Byzantine capital, about one inch deep and somewhat wider across the top; around this again spread gold acanthus-leaves supporting small pendants. The chains depending from it are stout flat almond-shaped pieces of pierced work.

It is curious to observe in some cases bits of mother-o'-pearl* set amongst valuable stones, and square pastes now colourless side by side with the richest: perhaps they were passed off upon the Gothic prince for real Opals by the court-jeweller of the day. It is very singular that neither the Ruby nor the Almandine should appear at all; the whole species (*Carbunculus*) must have been purposely left out for some mystic reason, probably as being regarded of too *Martial* a dye.

Most interesting, as it explains the destination of the treasure, is a large Greek cross bearing the inscription on both sides—

INDNI
NOM
INE
OFFERET SONNICA
SCIE

MARIE
INS
ORBA
CES.

* Which was regarded as precious, only second to the actual pearl, during the succeeding ages. In Henry III's list of jewels, above

which records its dedication by Sonnica in the church of S. Maria in Sorbaceis, "in the grove of sorb-apples," supposed to be the present S. Maria de Abaxo placed at the foot of the hill on which stands the city of Toledo.*

It may be remarked here that the Visigoths had enjoyed "the first pick" of the plunder of the dismembered empire. The nuptial gift which, according to the custom of his nation, was offered to Placidia by Adolphus (Alaric's brother and successor) consisted of the rare and magnificent spoils of her country, fruits of the recent sack of Rome. "Fifty beautiful youths in silken robes carried a *large* basin in each hand, and one of these basins was filled with pieces of gold, the other with precious, nay, rather with priceless, stones." So says Olympiodorus, her contemporary, who, from his mode of expression, seems to have assisted at the ceremony.

CROWN OF CHARLEMAGNE.

CHARLEMAGNE was crowned Emperor of the West by Pope Leo on Christmas-day, A.D. 800, in the Church of St. Peter's, Rome. His crown may therefore have been made in that city for the occasion; certainly its ornamentation has more of the Byzantine than the Frankish style. It is octagonal, formed by eight plaques of gold with round tops, which thus make a scalloped border to its upper part. Each alternate plaque bears the figure of a saint in enamel. The front plaque is set with large stones *en cabochon*

quoted, "cokilles" figure conspicuously amongst items of actual intrinsic value; and disks of the substance embellish in company with the gems the surface of Theodolinda's crown.

* M. Lesteyrie has published a full description in 4to. of these crowns illustrated with facsimiles the actual size in chromo-lithograph. These plates are the most successful specimens of the new process known to me, the gems showing out as if actually before the eye.

(Sapphires?), and others cut square after the fashion of table-diamonds (Emeralds, or Beryls?). Above all rises a Greek cross, also set with large stones: gems of less importance are equally interspersed upon the other plaques. From the cross springs an arch like a flying buttress which gives stability to the entire fabric. Frederic Barbarossa, in the year 1166, canonized Charlemagne, and took advantage of the occasion (even if he did not create it expressly), like a true Teuton, to despoil his sepulchre of the crown, besides the enormous mass of treasure, infinitely magnified by tradition, there deposited—the golden throne, the two shields of gold, &c. Since that time the relic was used at the coronation of the succeeding German emperors, and the Elector Palatine had the custody of it *ex officio*. The Austrian Francis, as the last in the Imperial series, had possession of the crown, and took good care to retain it; it now rests in the Imperial Library of Vienna, a mere monument of antiquity.

CROWN OF HUNGARY.

THIS memorial of the first establishment of Hungarian nationality has ever been regarded with superstitious veneration by every true Magyar, and authenticated every coronation of the kings of that country until the shameful overthrow of its liberties and constitution in our own times.* It is, in truth, a most venerable relic of the regular Byzantine art; and is formed by a broad flat band of fine gold, whence springs an arch, supporting a cross. It was sent, in the year 1072 by the Emperor Michael Ducas to Géisa, the first Duke of Hungary, or, as he is strangely (though with strict historical accuracy) styled

* When it disappeared, and its hiding-place remains known only to a faithful few.

in the enamel portrait of him, upon a plaque rising above the top of the circlet, "Geabitrás, king of the *Turks*." * Next to this comes the portrait of Constantine Porphyrogenitus, then one of Ducas himself; the fourth, and largest enamel, represents the Saviour enthroned exactly as he is figured upon the bezants of that period. These four portraits are set at the springing of the arches which close the top of the crown: on the front of the band itself are placed four smaller enamels of the angels Michael and Gabriel, St. George and St. Demetrius.

Over the medallion of Christ is placed a large heart-shaped Amethyst, below it an enormous rough Sapphire; four more large Sapphires are set at equal distances on the band, all but one being unpolished. The edges of the circlet are bordered with a row of Pearls set close together. The large Sapphire at the back is surrounded by four green stones, cut oblong; but their exact species has not been ascertained. In the deed by which Queen Elizabeth of Hungary pledged this crown to the Emperor Frederic IV., the stones are enumerated as being 53 Sapphires, 50 Rubies, *one Emerald*, and 320 Pearls. It is singular that the four green stones at the back are not entered in this list; perhaps they were known at the time to be only prases, and therefore not reckoned amongst the other stones of value.

It will be remarked from the foregoing details that, although the Byzantine jewellers had still at their command abundance of Sapphires and of the finest quality, the true Emerald had become very scarce. Yet, late under the Lower Empire, it was still profusely employed in the decoration of the imperial vestments, although ever accounted as next in value to the Diamond. Claudian

* They were a colony from the Turks originally seated beyond the Dou.

enumerates amongst the treasures left by Theodosius, under the guardianship of Stilicho—

*"Sidonias chlamydes et cingula bacca
Aspera, gemmataque togas, viridesque smaragd
Loricæ, galeasque renidentes hyacinthis."*

Sidonian mantles rich with purple fold,
Belts bossed with pearls, robes stiff with gems and gold,
And breastplates shining green with emeralds bright,
And helmets rich with precious sapphires dight."

In illustration of the last line, it may be remarked that his predecessor Constantine often figures upon his copper coinage in a helmet studded with gems set close together. This jewelled helm was the origin of the crown imperial in its present form; the gradual transition from the defensive to the decorative head-covering being easily traced upon the series descending of the Byzantine *solidi*. As to the excess to which this department of luxury, like all the rest, had been pushed by the Romans of more opulent times, a single anecdote of Pliny's will be a sufficient example (ix. 58):—

"I have myself seen Lollia Paulina (once the wife of the Emperor Caligula), though it was on no great occasion, nor she in her full-dress of ceremony, but at an ordinary wedding-dinner—I have seen her entirely covered with Emeralds and Pearls strung alternately, glittering all over her head, hair, bandeau, ears, neck, necklaces, and fingers.* the value of all which put together amounted to the sum of forty millions of sesterces (400,000*l.*), a value she was ready to attest by producing the receipts. Nor were these

* Reminding us of Sedley's lines—

"Such ropes of pearls her arms encumber;
She scarce can deal the carus at ombre;
Such loads of rings her fingers freight,
They tremble with the mighty weight."

jewels the presents of a prodigal Emperor—they were regular family heirlooms; that is to say, bought with the plunder of provinces. This was the end gained by his speculations, this the object for which M. Lollius made himself infamous all over the East by taking bribes from its princes, and at the last poisoned himself when C. Cæsar, Augustus' adopted son, formally renounced his friendship—all for this result, that his granddaughter might show herself off by lamplight bedizened to the value of forty millions of sesterces. Let any one now count up on the one side the sums carried in triumph by a Curius or a Fabricius, let him picture to himself their scanty display of treasure; and on the other side, Lollia, a wretched female, a tyrant's plaything, seated at the feast; would he not rather have seen them dragged down from the triumphal car, than to have conquered for an end like this?"

Amongst the other mad freaks of Heliogabalus was the serving-up dishes sauced with gold or precious stones; for example peas with gold-pieces, lentiles with Rubies, beans with Amber-beads, rice with seed-pearls (*Albis*). The last he used, instead of pepper, with his fish and truffles. It will be observed that in the foregoing dishes there is a studied union of the most plebeian fare with the most precious objects of luxury.

A notice in Lampridius (*sub Maximis*) gives us a curious peep into the trousseau of a Roman princess in the third century:—"Junia Fadilla, his betrothed bride, retained (after his murder) the imperial betrothal-gifts (*arrhæ regie*), viz., a necklace of nine single Pearls, a hair-net of eleven Emeralds, a bracelet with clasp of four Hyacinths.* Her contemporary Tertullian exclaims, with his usual energetic extravagance, in his tractate 'On Women's Beha-

* This is certainly the true reading of the passage: but differs considerably from that found in the old editions.

vour': 'The slight lobes of her ears outweigh a whole year's income, and her left hand squanders a money-bag on every one of its joints.' " Where *saccus* seems to denote a fixed sum, like in our day the Turkish *purse* (80*l.*).

Caylus (vii. pl. 70) figures a necklace that gives a good notion of the style of Lollia's jewelry. It consists of fourteen short six-sided prisms of plasma, and six irregular pastes connected together by two gold links between each. The plasmas are one-third of an inch long, and very neatly cut. Amongst the finest specimens now extant comes, undoubtedly, the one formerly in the Uzielli Collection (No. 637), composed of true-love-knots in gold, uniting large irregular Rubies and Emeralds (fine stones), each perforated at the ends. Lucian (Dial. Meret. vi.) makes the girl Corinna beg her mother to "buy her a gold necklace, having on it some fiery stones, like that of Philinnis." These people are of the lower class; the "fiery stones," therefore, must have been common Garnets, in which abundance of beads are found shaped exactly as the plasmas above mentioned.

Before dismissing this subject, its national interest pleads for a brief notice of another crown, though it boasts of no historical celebrity, all our ancient regalia having been sold by order of the Commonwealth Commissioners. Yet a few of the most important stones belonging to them were recovered from the purchasers, and employed in the crown made for the coronation of Charles II., and again when that was broken up introduced in that now in use. The following is an exact copy of Prof. Tennant's description of the Imperial State Crown of England:—

"The Imperial State Crown of H.M. Queen Victoria was made in the year 1838 by Messrs. Rundell and Bridge, with jewels taken from old crowns and others furnished by command of Her Majesty. It consists of diamonds, pearls,

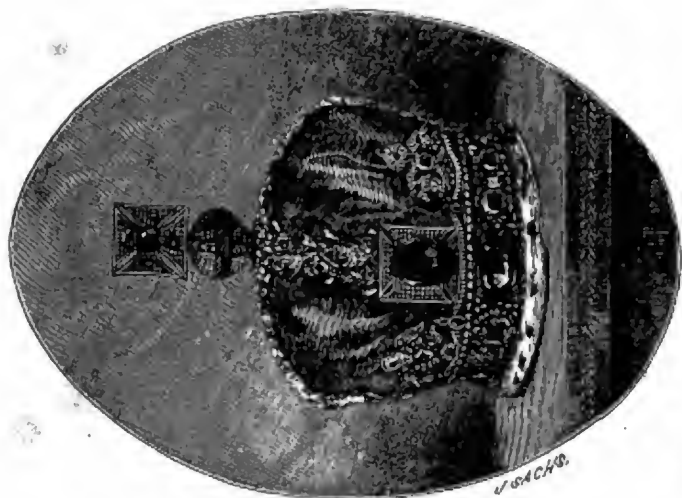
rubies, sapphires, and emeralds set in silver and gold: it has a crimson velvet cap with ermine border, and is lined with white silk. Its gross weight 89 oz. 5 dwts. troy.* The lower part of the band above the ermine border consists of a row of 129 pearls; and the upper part of the band, of a row of 112 pearls, between which in the front of the crown is a large sapphire (partly drilled) purchased for the crown by H. M. King George IV. At the back is a sapphire of smaller size, and six other sapphires, three on each side, between which are eight emeralds.

"Above and below the seven sapphires are fourteen diamonds, and around the eight emeralds 128 diamonds. Between the emeralds and sapphires are sixteen trefoil ornaments containing 160 diamonds. Above the band are eight sapphires surmounted by eight diamonds, between which are eight festoons consisting of 148 diamonds.

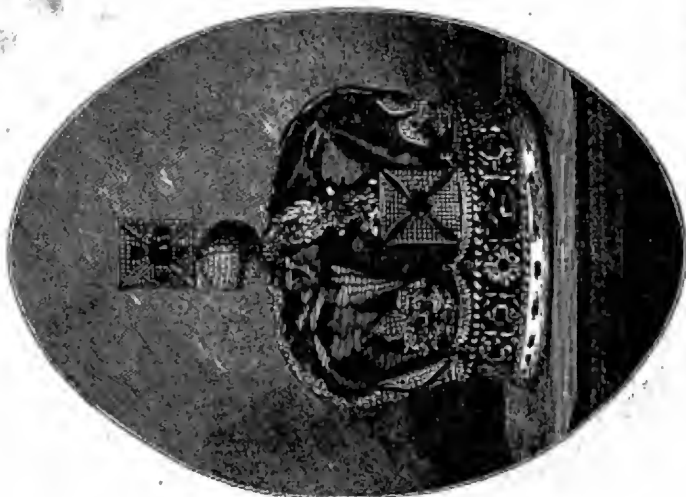
"In the front of the crown and in the centre of a diamond Maltese cross is the famous ruby said to have been given to Edward Prince of Wales, the Black Prince, by Don Pedro, king of Castile, after the battle of Najara, near Vittoria, A.D. 1367. This ruby was worn in the helmet of Henry V. at the battle of Agincourt, A.D. 1415. It is pierced quite through after the Eastern custom, the upper part of the piercing being filled up by a small ruby. Around this ruby to form the cross are 75 brilliant-diamonds. Three other Maltese crosses, forming the two sides and back of the crown, have emerald centres, and contain respectively 132, 124, and 130 brilliant-diamonds.

"Between the four Maltese crosses are four ornaments in the form of French fleurs-de-lys, with four rubies in their

* Barbot with some reason gently sneers at "*les nombreux ornements qui surchargent peut-être par trop cette pièce tout-à-fait dans le goût Anglais.*" He estimates the total value of the stones at 3,000,000 francs, or 120,000*l.*



Imperial State Crown of England.





centres, and surrounded by rose-diamonds: containing respectively 84, 86, 86, 87 rose-diamonds.

"From the Maltese crosses issue four imperial arches composed of oak-leaves and acorns: the leaves containing 728 rose, table, and brilliant-diamonds: 32 pearls forming the acorns set in cups, containing 54 rose-diamonds and one table-diamond. The total amount of diamonds in the arches and acorns is 108 brilliant, 116 table, and 559 rose-diamonds.

"From the upper part of the arches are suspended four large pendent pear-shaped pearls with rose-diamond cups containing 12 rose-diamonds, and stems containing 24 very small rose-diamonds. Above the arch stands the *Mound*, containing in the lower hemisphere 304 brilliants, and in the upper 244 brilliants: the zone and arc being composed of 33 rose-diamonds. The cross on the summit has a rose-cut sapphire* ('blue beryl,' Barbot) in the centre, surrounded by 4 large brilliants and 108 smaller brilliants."

SUMMARY OF JEWELS CONTRIBUTED IN THE CROWN.

- 1 large ruby irregularly polished.
- 1 large broad-spread sapphire.
- 16 sapphires.
- 11 emeralds.
- 4 rubies.
- 1363 brilliant-diamonds.
- 1278 rose-diamonds.
- 147 table-diamonds.
- 4 drop-shaped pearls.
- 273 pearls.

* There is a tradition that this sapphire came out of the famous ring of Edward the Confessor, so long treasured up on his shrine, and the heritage of which gave his successors the miraculous power of blessing the *cramp-rings*. If so, the stone must have been re-cut for Charles II. In the list of Henry III.'s gems collected for the shrine is entered a Sapphire of 52 dwts. = 312 car.: can it be this?

SACRED JEWELS.

GEMS, both unset and set, were from the very earliest times reckoned amongst the most grateful offerings to the gods, and therefore dedicated in profusion in their temples. Thus Boeckh's Inscriptions (dating from the Peloponnesian War) enumerate in the Treasury of the Parthenon: "A large onyx engraved with an antelope rutting, weighing 32 drachms; an onyx, plain, 276 drs. and half an obole; an onyx set in a gold ring; an onyx set in a silver ring; a jasper set in a gold ring; a jasper seal enclosed in gold (seemingly a mounted scarabeus); a signet in a gold ring; a signet in a gold ring dedicated by Dexilla (the two last were evidently cut in the gold itself); two gem-signets set in one gold ring; two signets in silver rings, one plated with gold; seven signets of *coloured glass*, plated with gold (*i.e.* their settings); eight silver rings, and one gold piece, fine (probably a Daric); a gold ring of $1\frac{1}{2}$ drs. offered by Axiothea, wife of Socles; a gold ring with one gold piece, fine, *tied* to it, offered by Phryniscus the Thessalian; a plain gold ring weighing half-a-drachm offered by Pletho of Ægina (a widow's mite); five ear-rings in *tin* offered by Thaumarete."

And this custom flourished down to the fall of Paganism, but the donaria at the shrines of Imperial Rome were of a very different class from the tiny jewels extorted from the devotion of the poverty stricken natives of Attica. Precious stones, in their native state, and engraved gems, still continued to pour into the sacred treasuries. Every example of unusual beauty or rarity became a thank-offering to the patron-god of its possessor. Pompey consecrates to Jupiter the rarest mineral specimens found in the Pontic treasury; Caesar, an enthusiastic gem-collector, six caskets of his own choicest rings to his progenitrix, Venus; his amiable

descendant Marcellus, another to the goddess of Peace.* The largest block of crystal ever seen, Pliny tells us, was that dedicated in the Capitol by Livia Augusta. In such a form also did the gems appear, described by Lucian, in his *Dea Syria* (32), as decorating the celebrated statue of that goddess, Astarte the great goddess of Edessa: †—“Precious stones colourless (diamonds), water-coloured (beryls), fiery (rubies), the sardonyx-stones, hyacinths, and emeralds, brought hither by Egyptians, Indians, Ethiopians, Medes, Armenians, and Babylonians.” ‡

Other gems, valuable from their magnitude, were consecrated by engraving upon them the head of some particular deity: an example of which is the splendid pyramidal amethyst (Besborough), thus dedicated to Serapis. The same cabinet, by a singular coincidence, preserves, in No. 10, one of these very offerings to the *Dea Syria*: a nicolo of unusual magnitude, on which is figured the deity herself seated on her lion, flanked by the Dioscouri, with the dedicatory legend—

OTPAHIA HPA—AMMONIOC ANΘΗΚΕ ΕΠΙ ΑΓΑΘΩ,

“To the celestial Juno, dedicated by Ammonius for good luck,” marking it for bribe to secure the future patronage of this divinity. Another noble gem, figured by Caylus, represents Serapis attended by Venus and Harpocrates with

* A great Roman temple was a regular British Museum for the heterogeneous character of the rarities exhibited therein, from the great serpent (stuffed), 120 feet long, of the river Bagradas, who singly defied Regulus and his whole army, down to the identical ring that Polycrates threw into the sea.

† According to Plutarch, the personification of nature, or the Principle generating all that lives out of *moisture*.

‡ These gems, offerings perpetually renewed, were probably stuck by the devotee with wax upon the goddess's lap: this being the established mode of dedicating minute and precious *donaria*, as the same author tells us in his *Philopotesudes* apropos of the statue of Pelichus, which had become the abode of a *Lar familiaris*, or *haus-geist*.

various attributes, and the statement that it was engraved KATA XPHMATICMON, "by command of an oracle."

But the most interesting monument of such a dedication, furnishing us as it does with the list of the contents of a wealthy Roman lady's jewel-box, is the inscription given by Montfaucon (Pl. 136), cut upon the pedestal formerly supporting a statue of Isis as is supposed, discovered at Alicante. It records that "by divine command Fabia Fabiana had dedicated in honour of her granddaughter Avita (deceased, it would appear) 112½ pounds' weight of silver plate: also, ornaments in the *basilicum* (diadem), one *unio*,* and six *margarita*, emeralds two, *cylindri* (beryls) seven, carbuncle one gem, hyacinth one gem, *ceraunice* (rubies) two. In her ears: emeralds two, pearls two. On her neck: a *quadribacium*, or quadruple row of pearls thirty-six, emeralds eighteen. In two circlets or anklets (*clausuris*) on her legs: emeralds two, *cylindri* eleven. In her bracelets (*smiallis*): emeralds eight, pearls eight. On her little finger, two rings with *diamonds*: on the next finger, a ring with many gems (*polysephus*), emeralds and one pearl (a *cluster-ring*, as we should call it); on the *top-joint* of the same finger a ring with an emerald. Upon her shoes, *cylindri* eight in number."

It cannot be imagined that in the flourishing times of art the Greeks attempted to enhance the divine beauty of their embodied deities by bedizening them in the jewelry

* In this list the distinction made between the *unio* and the *margarita* has to be noted; the former the pearl of spherical shape and infinitely the more valuable; the latter the irregularly formed, Pliny's *elanchi* and *crotalia*. The notice of the "two diamond-rings, and the emerald-ring on the top joint of the ring finger" is very curious. The value of the hyacinthus is apparent, for but a single one figures in the list. "*Gemma*" implies it was engraved. The pious old lady had evidently offered the entire set of jewels belonging to her deceased grandchild for the repose of her soul.

of people of fashion, but such had become the regular practice with the superstitious, semi-Oriental devotees of the Lower Empire. The Persian envoy presented to Sev. Alexander, for his empress, a pair of round pearls of extraordinary weight and beauty. The Roman ordered them to be sold, but no one was found able to pay their estimated value. He, therefore, not choosing that his wife should set a bad example by wearing such costly decorations, dedicated them in the ear-rings of Venus, where, it may be supposed, the perfect twins replaced the split one of Cleopatra's. Another remarkable example is the necklace of the most costly stones upon the statue of Vesta, to whose vengeance Zosimus (a devoted adherent to the ancient faith) ascribes the tragic end of Serena, Stilicho's widow, who had despoiled her of it. This was done after her temple had been deserted by its former guardians, in consequence of the confiscation of its revenues by the needy government, though still for some time protected from robbery by the *religio loci*. The historian, though lamenting the cruel fate of so worthy a princess—she had been strangled by the command of the miserable Honorius—cannot refrain from instancing the poetical justice of the mode of execution, "which encircled with the cord a throat previously decorated with a necklace obtained by sacrilego from the most venerable of the Roman shrines."*

* The possibility of such a resumption by mundane vanity of dedicated jewelry, the wiser Christian priesthood have obviated by the ingenious expedient of immediately substituting paste facsimiles in every new offering, and treasuring up the originals in the strong box of the sacristy, as it is proper to believe. The "Annunziata" of Rome, and her sisters of Florence and of Madrid, are loaded with sets of *parures* of incalculable value when presented, and to the eye of the uninitiated offering the same magnificent show. Lady M. W. Montagu remarks that the result of the permission granted her, in virtue of her quality, to inspect the relics in all the German churches (1715), was the conviction that all the diamonds and rubies adorning them were only pastes.

The same custom of dedicating uncommonly fine specimens of precious stones to the honour of the Deity, or his saints, was carried down far into the Middle Ages. In the *Palio* or chased gold frontal of the high-altar of S. Ambrogio, Milan, is inserted a long oval topaz inscribed *Q D A I G V T O V*, which can only be interpreted as the votive offering of Riada, some Lombard contributor to its construction in the ninth century. Under *Lychnis* I have noticed the far-famed *karfunkel*, so long believed by report to have lighted up the shrine of S. Elizabeth of Marburg. Leofric, the tenth abbot of St. Alban's, Matthew Paris tells us in his Life, in order to relieve the poor during a great famine, sold all the plate belonging to his church, except "certain noble engraved gems now vulgarly called *camei*, for which he could find no purchasers." And the Patent Rolls give a detailed list of the *camei* collected by Henry III. for the embellishment of the shrine he was projecting for Edward the Confessor. They were over eighty in number; amongst which fifty-five are particularized as "large," and one especially "in a gold setting with a chain to it," is valued at 200*l.*, an incredible sum if brought to the present standard, which requires it to be multiplied at least twenty-fold. Besides these, several precious stones, of large size, especially sapphires, appear in this list, as set in the breasts or held in the hands of the numerous statuettes in gold, where "Peter trampling upon Nero" figured in company with sainted Saxon kings, which embellished this incredibly rich production of the artist-goldsmiths of the thirteenth century.

But the richest assemblage of gems, both intrinsically valuable, and priceless as works of art, was that formerly enriching the abbey of St. Denys. Many of them had come down from the Carlovingian kings, some were presents from the early Byzantine emperors, others trophies of the

Frankish conquest of Constantinople. The greater part appear to have been introduced in the ornamentation of the statuettes in gold and silver, and on the reliquaries in other shapes, in devising which the ingenious devotion of the Middle Ages delighted to exert its skill and fancy. A description invaluable to the admirer of mediæval art, and full of curious details of these riches, drawn up at the time of their greatest splendour, will be found in the old Benedictine Dom Doublet's '*Trésor de S. Denys*,' published in 1625.



URIM and THUMMIM: Λόγιον: *Rationale.*

My record of Sacred Jewels would be sadly incomplete did it close without a few words concerning that most ancient and most *virtuous* of them all, being at once decoration, periapt, and talisman, Aaron's Breastplate. It was a *decoration*, from the costliness of its nature; a *periapt*, for it was suspended round his neck by golden chains; a *talisman*, for it ensured the divine protection to the tribes whose names were thereon engraven.

This magnificent sacerdotal ornament, still represented in the *piiviale* or immense circular disk serving as a *morse* for the vestments of the Pope, was in its primary form doubtless no other than one of those square vitrified tablets, enamelled *blue*, embossed with the image of a deity seated within his shrine, and which were worn as his distinctive badge by the Egyptian priest when performing his sacred functions. *Ælian* (xiv. 34), in fact, states that the high-priest of the Egyptians, who was at the same time the supreme *judge*, when administering justice, wore suspended round his neck an image, called "Tsuth," made of the Sapphire-stone (our lapis-lazuli): and of this so precious material the tablets now extant are evident imitations. *Epiphanius*, following some ancient tradition, records that when the Jewish high-priest entered the Holy of Holies on the three great days, Pascha, Pentecost, and the Feast of Tabernacles, he wore suspended *over the breastplate* the "Declaration," as he translates the mystic words "Urim and Thummim."

This was the *Adamas* of a cerulean colour (our Sapphire), which by its change of hue *declared* the favour or the wrath of Jehovah towards his people, for it turned black as night before a coming pestilence, red as blood before war, but shone bright and blue when it announced coming prosperity.

Of this important jewel, the very soul, so to speak (if we credit Epiphanius), of the entire Rationale, neither the Pentateuch nor Josephus make the least mention, as an adjunct altogether distinct and superior to the breastplate itself; but the notice of it preserves a tradition of the original nature of the appendage, before the whole jewel had received the embellishments and enrichments of the Persian taste. In fact the Hebrew "*Urim and Thummim*" * are translated by the LXX. "*The Declaration and the Truth.*" The latter word plainly enough refers to the Egyptian original, similarly designated. The Greeks, says Josephus, named the breastplate "*The Oracle of Judgment,*" and this title *Λόγιον*, too literally translated into ecclesiastical Latin, becomes "*Rationale,*" though the proper rendering is "*Oraculum.*" Its Hebrew appellation is "*Hosen,*" or "*Essen.*" It is worthy of remark that Epiphanius particularizes the cerulean colour of the Declaration or *Adamas*.

The universal tradition amongst the Greeks as to the origin of the Jewish nation, and which Diodorus Siculus has recorded, related that it was a colony sent out from Egypt into Syria, at the very same time that Danaus sailed for Greece, and the striking similarity between the institutions of Moses and the Egyptian laws, of which the same author gives a full and most interesting summary, supported

* Moses, however, certainly applied these words to the twelve gems themselves: "And thou shalt put into the breastplate of judgment the Urim and Thummim," &c. (Exod. xxviii. 30).

the opinion amongst all his contemporaries. In fact, from their own chronicles, the Jews themselves appear to have retained a strong attachment to the supposed parent state; extremely unaccountable had tradition only described it to them as "the house of bondage." In all their political distresses, whenever hard pressed by their Syrian neighbours, the idea of a return to Egypt ever suggests itself to them as the surest escape, although vehemently opposed by the sacerdotal order. The famous letter of Areius, king of the Lacedemonians, to the high-priest Onias (Josephus xii. 5), in which he alludes to the common descent of both nations from Abraham! even though it were a Jewish forgery, serves to show, and the argument is the stronger if it be a forgery, how established was the belief in the original unity of the two races: which presupposes them both colonies sent out from the same mother-country. Diodorus also (i. 4) speaks of the Egyptian Hercules as having travelled all over the world before erecting his celebrated Pillars; and it was from this god that the Spartan royal family claimed their descent. Again it was on the score of their common parentage that the Spartans salute the Jews as their brethren in their letter of congratulation to Simon Maccabeus, on his re-establishing the independence of his nation; and intimate relations seem to have been kept up to the last between Jerusalem and Sparta. It was a noble Spartan, Eurycles, who became the prime minister of Herod the Great, and who by his pernicious counsels brought about the ruin of his family.

The Breastplate was in form a square of a span, that is, 8 inches every way; and having the stones set in four rows, containing three each, it follows from this arrangement that each stone, with its setting, must have occupied a space $2\frac{1}{2}$ inches long by 2 deep, and hence that they were cut into an elliptical shape exactly like the cartouches

inclosing proper names in Egyptian hieroglyphics—the identical form we should have expected in a piece of jewelry executed under similar historical circumstances. As to their arrangement according to their species, no better authority can be adduced than that of Josephus, a writer who from his position had frequent opportunities of inspecting the original, both when in use and when deposited in the Temple of Peace in Rome, and whose description moreover could, for three centuries at least after, be verified by any of his readers who was inquisitive upon the subject. His list, too, is confirmed by that given in the Vulgate, an authority also of weight in such a matter, being written at a time, the fifth century, when the knowledge of precious stones, and of the true meaning of their Hebrew appellations, may be supposed to have been still maintained.

1st Row.—Sardius, red; Topazius, yellowish green; Smaragdus, bright green.

2nd Row.—Carbunculus, red; Sapphirus, blue; Jaspis, green.

3rd Row.—Ligurius (lyncurium), yellow; Achates, black and white; Amethystus, purple.

4th Row.—Chrysolithus, yellow; Onyx, blue and black; Beryllus, pale green, or pale blue.

Our version gives a different arrangement,* but the stones the same with one exception; it substitutes the *Diamond* for the Chrysolithus, a most absurd exchange, for besides its being totally beyond the power of any ancient engraver to have inscribed the tribe upon this invincible substance, a Diamond to correspond in dimensions with the rest of the stones in the Breastplate must have exceeded the Koh-i-noor

* Viz., Sardius, Topaz, Carbuncle.
Emerald, Sapphire, Diamond.
Ligure, Agate, Amethyst.
Beryl, Onyx, Jasper.

in superficial extent. Epiphanius acutely (for once) notices a remarkable omission in the series—there is no *Hyacinthus* (our Sapphire). He conjectures that by the *Ligurius*, a name not to be found in any of the authors he had consulted, the *Hyacinthus* must be understood, on the ground that a gem ranking so high in value could not but have had a conspicuous place in the catalogue. But Isidorus, a century and a half later, actually gives *Ligurius* as synonymous with *Lyncurium*: "*Ligurius vocatur quod fit ex urina lyncis bestię*" (xvi. 8); and this was our *Jacinth*, a gem exactly resembling amber, as clearly appears from what Theophrastus says of it. As for the *Onyx*, there can be no doubt it was the kind now called *Nicolo*, for De Boot mentions that in his times (circ. 1600) it had ever been peculiarly valued by the Jews upon this very account, as being the true species of the two large *Onyx*-stones engraved with the names (Exod. xxviii. 9) of the tribes, six on one and six on the other, which being set in ouches of gold, were fixed upon the ephod, and whence proceeded the two wreathed chains by which the Breastplate hung. And without doubt this tradition is correct, for Pliny notes that the popular name for this kind was *Ægyptilla*, and that it came from Arabia.*

Josephus adds that all the stones were conspicuous for their size and beauty, and of inestimable value. The names of the tribes were engraved in the "national character;" but the Breastplate known to him could not have been the original one made by the directions of Moses, for a reason hereafter to be considered. But before going further, one point requires attention. By "national character" Josephus could only have meant the Chaldee, or modern Hebrew letter, used in his times for the Scriptures; and this of

* In fact it is merely the Arabian *Sardonyx*, with the third or top-most layer removed.

itself proves the comparatively recent date of the inscriptions. For the Chaldee,* after Ezra's legislation, became the sacred alphabet of the nation: if they used any *alphabetical* characters at all before the Captivity, they must have belonged to the oldest Punic.

This Breastplate, Josephus records, when put on by the High-priest on great solemnities, shot forth brilliant rays of fire that manifested the immediate presence of the Deity. He, however, prudently subjoins that this miraculous property had become extinct, in consequence of the impiety of his people full two centuries before the time at which he was writing.

The Rabbins told a curious and characteristic legend as to the mode in which the holy characters were cut upon these incomparable stones. Moses effected this by simply tracing the words in the blood of the worm *Samir*, a liquid of such wondrous potency as immediately to dissolve and corrode the hardest substances. This fable is entirely based upon the name of the chief agent used by the ancient gem-engravers, *Smir*, written in Hebrew *Samir*. This was quite sufficient stuff for those fanciful sages to enlarge into so truly Oriental a story, and probably their imaginations were aided by some tradition as to a secret process known to the Egyptians for softening extremely obdurate materials—a thing which there are, indeed, some grounds for considering possible. It is curious that Heraclius, in his extraordinary treatise, 'De Artibus Romanorum,' gives a recipe for softening gems for engraving upon, in which *earthworms* are the chief ingredient.

It will sound incredible to the ears of the uninitiated,

* More properly the oldest form of the Pehlevi, as it appears in the Persepolitan inscriptions, which is almost identical with the Rabbinical Hebrew letter. Artaxerxes, the first of the Sassanian line, uses it on his coins.

yet every one conversant with the nature of gems will admit that these most venerable productions of the glyptic art must still be in existence, and in all their pristine splendour. No lapse of time produces any sensible effect upon these relics, as the perfect conservation of such in a softer material—mere vitrified clay—proves, and yet we have abundance of tablets bearing the titles of Thothmes III., the contemporary of Moses himself. Besides this, their intrinsic value as the finest gems that could be dedicated by the zeal of a race trafficking all over the world must have caused them to be esteemed the most precious of trophies, to be guarded with the most jealous care by all the conquerors into whose hands they successively fell. Even supposing them extracted from their primary arrangement and re-set amongst the other state jewels of their captors, the essential portions of the stones, with their inscriptions, would still remain unchanged. Perhaps this was the reason why the Rationale is not to be found in Ezra's list of the sacred articles restored by Cyrus to the Temple of Jerusalem—the 5400 gold and silver vessels. The latter appear to have been easily identified: because, according to the practice of the East, they had all been placed as offerings and trophies in the grand temple of the Babylonian Belus; it is certain they, during those seventy years, had still remained hallowed for sacred usage, for their profanation for the first time by Belshazzar is assigned as the deed that filled up the measure of his iniquities.

The Breastplate described by Josephus was carried to Rome along with the other spoils of the Temple upon the destruction of the Holy City by Titus. The magnificent Temple of Peace, just erected by his father, was the place selected to hold these trophies after they had been paraded in his triumph through the streets of Rome. Of their sub-

sequent fate there are three conflicting accounts; the first that they were sent off by Genseric to Carthage upon the sack of Rome, but that the ship, with them on board, was lost on the voyage. But some at least, if not all, must have fallen into Alario's hands when he sacked the city some fifty years before, if there were any foundation for the belief mentioned by Procopius. He states that the main reason why the Franks in the sixth century pressed the siege of Narbonne, the Visi-Gothic capital, with such eagerness, was the being there deposited the treasure of King Ataulphus, which boasted, amongst its other incalculable riches, of vases formed out of Emeralds (*prasini*, he uses the contemporary Latin term for the *precious* kind), made of old time for the use of the Temple by King Solomon. The third story rests on better authority than either of the preceding. Procopius, an eye-witness, states that amongst the innumerable spoils of Carthage, carried in his Vandalic triumph by Belisarius through Constantinople, were the *vessels of the Temple of Jerusalem*, formerly the prey of Genseric (Bell. Vand. xi. 9). Justinian deposited them in the sacristy of Sta. Sophia; but hearing of a remark made by a Jew how these spoils brought ruin upon all who presumed to detain them from the place for which they had been made, being struck with the fear of sacrilege, sent them off with all possible dispatch to the Christian church of the Holy Sepulchre, Jerusalem. In this case they must soon after have fallen again into the hands of another Persian conqueror, Chosroes II., when he took the Holy City in 615, and abundantly verified the Jews' prediction by the speedy destruction they brought upon the Sassanian dynasty, extinguished in blood A.D. 632. Hence there is good reason to suppose them still buried in some unknown treasure-chamber of one of the old Persian capitals, and to have a chance of emerging from oblivion at no very distant day

when the dark nooks of the Shah's or Sultan's treasure-vaults come to be ransacked by the Russian heir apparent to the "two sick men," who already

"Circum loculos et claves lætus ovanque
Currit."

What a source of rejoicing both to archæologists, and above all to the religious world, will be the identification of even one of these venerable relics! A contingency by no means to be pronounced chimerical in an age which has witnessed the resuscitation of Sennacherib's own cup, signet, and queen's portrait.

THE NEW JERUSALEM.

IN St. John's vision (xxi. 1) of "the Holy City, New Jerusalem, coming down from God out of heaven, prepared as a bride adorned for her husband," he depicts her walls as built out of *twelve* courses of precious stones. It is a singular fact that these stones are not arranged here in the same order as in the Rationale, a collocation we should have expected so thoroughly Hebrew a writer to have adopted as a matter of course, the more especially as they represent the same idea in both cases. Instead of this, he has most ingeniously disposed them according to their various shades of the same colour, as the following list will demonstrate, taking them in order from the bottom upwards:—

1. Jaspis, dark green. 2. Sapphirus, blue. 3. Chalcedon, a greenish blue sort of Emerald.*
4. Smaragdus, bright green. 5. Sardonyx, red and white.
6. Sardius, bright red.

* Understood by Marbodius as the Carchedonius, or African Carbuncle, which only shines by night, and then flame-coloured: a very common confusion of the two names, arising from the similarity between Καλχηδων and Καρχηδων.

7. Chrysolite, golden-yellow. 8. Beryl, bluish green.

9. Topazius, yellowish green.

10. Chrysoprasus,* apple-green. 11. Hyacinthus, blue.

12. Amethyst, violet, or purple.

Neither is this order of the colours suggested by the rainbow, as their heavenly position would naturally suggest, for in that primeval symbol of God's covenant the colours follow thus:—red, orange, yellow, green, blue, purple, violet. Again, St. John being so close an imitator of Ezekiel, one might have presupposed him guided by the prophet's most poetical apostrophe to the king of Tyrus (xxviii. 13), "Thou has been in Eden the garden of the Lord; every precious stone was thy covering: the Sardius (marg. Ruby), Topaz, and the *Diamond*; the Beryl (marg. Chrysolite), the Onyx, and the Jasper; the Sapphire, the Emerald, (marg. Chrysoprase), and the Carbuncle." †

So minute an acquaintance with the nicest shades of colour of the precious stones will more forcibly impress the reader, if he should attempt to arrange from memory, and by the aid of his own casually acquired knowledge alone, twelve gems or even half that number according to their proper tints. Without a practical acquaintance with the subject such an attempt will only end in confusion. The "sainted seer" alludes in other passages to the proper colours of precious stones in a very technical manner: "He that sat on the throne" was like the Jaspis and the Sardius, and was crowned with a rainbow like the Smaragdus; whilst the light within the Holy City was like "a very precious stone, a Jaspis resembling Crystal" or

* For this Marbodus has evidently read *Chrysopasion*, a dark blue studded with gold-dust: if correct, the three shades of blue would then follow each other in order.

† Here again the old text of the Vulgate differs considerably: "*Lapis pretiosus in operimentum tuum: Sardius, Topazius, Jaspis; Chrysolithus, et Onyx, et Beryllus; Sapphirus, et Carbunculus, et Smaragdus.*"

the green of the *Plasma* united with the brilliancy and lucidity of the Crystal, by which he probably sought to distinguish the true Emerald; ever a special favourite with the Jews. Such allusions display that exact knowledge of particulars only possessed by persons either dealing in precious stones, or from other circumstances obliged to have a practical acquaintance with their nature, which could never have been found in a Galilean fisherman; unless we choose to cut the knot of the difficulty with the ever-ready sword of verbal inspiration. Here then may be found another argument to support the opinion that St. John the Evangelist and the Divine were two different persons. The image, however, of the Holy City built up of precious stones is not original, for it occurs in the prayer of Tobias; certainly, whatever be its date, a much more ancient composition than the Apocalypse. In our version the passage stands thus: "Jerusalem shall be built up of Emerald, Sapphire, and all precious stones, her walls, and towers, and battlements of most fine gold. . . . the streets of Jerusalem shall be paved with Carbuncle, Beryl, and stones of Ophir." It is possible the writer may have had in his mind the old legend derived from his brethren in Persia, as to the seven concentric walls of Ecbatana, coloured in this order; black, white, red, blue, yellow, silver, gold: a disposition apparently having reference to the planets, so important in the religious system of the Chaldeans.

St. John doubtless intended his twelve colours to typify the twelve tribes, and saw no other, nor deeper, meaning in them, but Marbodius has ingeniously applied them to express the several virtues that ought to build up the Christian Church, of whose fanciful allegory the following verses are a close translation:—

Celestial tribes! together sing
 Loud praise to God, of kings the king,
 For he's the architect supreme
 Of heaven's own New Jerusalem;
 Within whose edifice is laid
 The bright foundation thus displayed:

Prefigured in the *Jasper's* green
 The springing plant of *Faith* is seen;
 That faith, which is the perfect man,
 Entirely wither never can;
 By whose protecting buckler wide
 The fiend's assaults we turn aside.

Upon the *Sapphire* blue is shewn,
 The reflex of the heavenly throne:
 In this the simple heart we view
 Which holds in *Hope* the promise true,
 A life which graced with virtues bright
 Sheds far and wide a brilliant light.

The pale *Caledony* the rays
 Of faintly smouldering fire displays,
 A glimmering dull by day it shows
 But in thick darkness fiercely glows;
 And here the type of those we see
 Who serve the Lord in secrecy.

In th' *Emerald's* hue of matchless green,
 Which casts abroad an oily sheen,
 An image apt of *Faith's* supplied;
 To every good thing open wide,
 Which in a constant course proceeds
 Of never-ending pious deeds.

The *Sardonyx* hath colours three—
 The inner man 't will shew to thee—
 Humility may dim his worth
 Yet Chastity shall set it forth;
 And, to complete his honoured praise,
 Red Martyrdom shall crown his days.

The *Sardius* stone is shining red,
 Deep with the hue of blood o'erspread;

In this the world may fitly see
The martyr's glorious victory :
Sixth in the list it shines above,
Joined to the mystic Cross of love.

The *Chrysolite* with golden rays
Flames like a fiery oven's blaze ;
It in clear sense the truly wise,
The perfect Christian, typifies,
Who through the sevenfold gift of God
His shining radiance flings abroad.

The *Beryl* shows a limpid gleam—
Sol's light reflected in the stream ;
In it those vows an image find,
The longings of the pious mind
To quit the world and all its strife
And seek the gate of quiet life.

The *Topaz* is a jewel rare,
And therefore must be bought full dear ;
Made up of hues of golden light
And with celestial lustre bright :
Here see the man on study bent,
A life in contemplation spent.

The *Chrysoprase* may justly boast
The likeness of the purple host :
How richly dyed its mottled mould
Besprinkled thick with stars of gold !
This is that true, that perfect Love,
Whose truth no cruelty can move.

The *Hyacinth's* celestial blue
Is tempered by a milder hue ;
A stone it is of varying ray,
And changes with the changing day :
A pious life it seems to draw,
Well guided by discretion's law.

On high the *Amethyst* is set
In colour like the violet,
With flames as if of gold it glows
And far its purple radiance throws ;
The humble heart it signifies,
Of him who in the Saviour dies.

These precious stones the picture give
 Of saints who in the flesh yet live,
 Their various colours bright as day
 Virtues of various kind portray :
 With these whatever man shall bloom
 He 'mongst thy dwellers shall find room.

Jerusalem of peace the heir !
 These stones be thy foundations fair ;
 How blest, how near to God the soul
 Inscribed upon thy muster roll :
 The watchman that thy towers doth keep
 Shall never close his eyes in sleep :

Grant Sovereign of the heavenly city,
 Grant Holy One, of thy large pity,
 That when this fleeting life is spent
 We may thy courts above frequent,
 And mid the host of saints thy praise
 Like them to endless ages raise ! ”

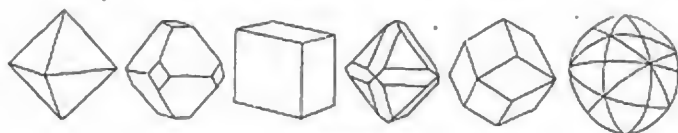
In the original MS. of this poem some notes follow, extremely curious as indicating that the art of gem-engraving was not quite extinct at the date of the composition, late in the eleventh century. For example : “ The Calcedony blest and tied about the neck cures lunatics. One ought to engrave upon it Mars armed and a virgin robed, wrapped in a vestment, and holding out a laurel-branch. The Beryl—engrave upon it a lobster, and under its legs a raven ; and put beneath the gem a vervan-leaf inclosed in a little plate of gold : being consecrated, it makes the wearer conqueror over all bad things, and preserves from diseases of the eyes. The Sard is good to be worn, and makes the person beloved by women ; engrave with a vine with ivy twining round it. The Castais is good for obtaining liberty, when consecrated and all things duly performed about it. To perfect the gem when you

have obtained it, do thus: engrave upon it a beetle and a man standing underneath; afterwards let it be bored through its length and set upon a gold fibula; then, being blest and set up in a proper place, it shall shew forth the glory that God hath given it."

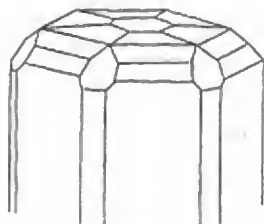




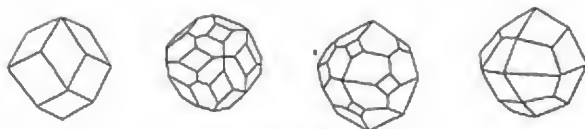
CRYSTALLIZATION OF PRECIOUS STONES.



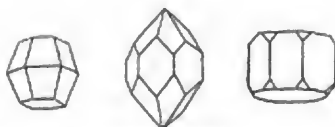
Diamond.



Emerald.



Garnet.



Ruby and Sapphire.



Zircon: Jacinth.

I. THE CHEMICAL ANALYSIS OF PRECIOUS STONES.

BERYL: EMERALD.

Combination of glucina, silica, and alumina.

	Emerald.			Beryl.		
Glucina	12	50	....	15	50	
Silica	68	50	....	66	45	
Alumina	15	75	....	16	75	
Oxide of Chrome ..	0	30	....	0	00	
Oxide of Iron	1	00	....	0	60	
Lime	0	25	....	0	00	

Sp. Gr. 2·76 to 2·73. H. 7·5—8.

Native form: a hexahedral prism terminated in a six-sided pyramid, imbedded in a vein of magnesian limestone traversing hornblende rocks. Colour: Emerald, grass-green; Beryl, light green, tinged more or less with blue.

CALCEDONY.

Consists of silica and alumina.

Silica	84	0
Alumina	16	0

Sp. Gr. 2·6. H. = 7.

Agate, Heliotrope, Onyx, Plasma, Sard, are all varieties of Calcedony differently coloured by metallic oxides.

Native form: botryoidal (grape-like) masses; but more frequently found in rolled pebbles.

DIAMOND.

Pure carbon. Sp. Gr. 3·55 (inferior to the Sapphire).

Hardness = 10, the highest in the scale. Highly electric by friction.

Native form: an octahedral crystal, usually modified by the obliteration of the angles and edges: found mixed with gold-dust in a hard ferruginous concretion gravel. Colour: pure white, often tinged with yellow, red, blue, &c.

GARNET.

Combination of a silicate of the protoxide of iron with silicate of alumina.

Silica	..	..	..	..	..	33·75
Alumina	..	..	..	..	..	27·25
Oxide of Iron	..	..	..	..	..	36·00
Oxide of Manganese	..	..	..	..	..	0·25

Sp. Gr. 4·2. H. 6·5 to 7·5.

The native garnet (Almandine) is not electric by friction, but when polished and faceted I have found by experiment that it becomes highly so.

Native form: a rhombic dodecahedron, imbedded in mica-slate; also loose in the earth. Colour: dark red, sometimes purple.

LAPIS-LAZULI.

Silica	..	..	..	..	..	49·0
Alumina	..	..	..	..	..	11·0
Lime	..	..	..	..	..	16·0
Soda	..	..	..	..	..	8·0
Oxide of Iron	..	..	..	..	..	4·0
Magnesia	..	..	..	..	..	2·0
Sulphuric Acid	..	..	..	..	..	2·0

Sp. Gr. 2·95. Hardness sufficient to scratch glass.

Found massive, but sometimes in rhombic dodecahedrons: colour, pure azure.

OPAL.

Combination of silica and water.

Silica	..	..	..	..	..	90.0
Water	..	..	..	..	..	10.0

Sp. Gr. 2.9. Hardness not sufficient to strike fire with steel.

Found massive imbedded in a decomposed porphyry and in trap-rocks: colour, milky, but richly iridescent.

PERIDOT; CHRYSOLITE.

Combination of magnesia, silica, and peroxide of iron.

Magnesia	..	..	..	..	..	43.5
Silica	..	..	..	..	..	39.0
Oxide of Iron	..	..	..	..	..	19.0

Sp. Gr. 3.3—3.5. H. = 6.5—7.

Primary form: a right prism, with rectangular bases; but occurs more frequently in rounded crystalline masses. Colour: green, more or less mixed with yellow.

SAPPHIRE; RUBY; ORIENTAL TOPAZ.

Pure alumina, coloured from admixture with oxide of iron.

	Sapphire.				Ruby.	
Alumina	98.5	...	90.0
Lime	0.5	...	0.0
Silica	0.0	...	7.0
Oxide of Iron	1.0	...	1.2

Sp. Gr. 3.99. Hardness only inferior to the diamond. Highly electric.

Native form: six-sided prism variously terminated, but more frequently found in rolled masses. Colours: blue, blood-red, and yellow.

SPINEL AND BALAIS.

Combination of alumina and magnesia, coloured red by a minute admixture of chromic acid, or blue by the protoxide of iron.

	Red.	Blue.
Alumina	74.50	72.65
Magnesia	8.25	14.63
Silica	15.50	5.45
Lime	0.75	0.00
Protoxide of Iron ..	1.50	4.2

Sp. Gr. 3.5. H. = 8.

Native form: the perfect octahedron, like the diamond, and similarly modified. Colour: Spinel, red, or slightly tinged with cinnamon; Balais, pale rose, or lilac.

TOPAZ.

Combination of alumina, silica, and fluoric acid.

	Brasil.	Saxony.
Alumina	47.5	59.0
Silica	44.5	35.0
Fluoric Acid	7.0	5.0

Sp. Gr. 3.49 to 3.56. H. = 8. Highly electric by friction.

Native form: prism with the sides deeply striated, and the ends very variously terminated. Colour: vinous yellow.

TURQUOIS.

Considered by Fischer to be only clay coloured by oxide of copper; but Jahn notices—

Alumina	73.0
Oxide of Copper	4.5
Oxide of Iron	4.0
Water	18.0

Sp. Gr. 2.8—3.0. H. 5 to 6.

Occurs in kidney-shaped masses, usually botryoidal, or mimil-lated: colour, blue.

ZIRCON.

Combination of zirconia and silica.

			Jacinth.		Jargon.
Zirconia	..	..	70.0	.. ..	66.0
Silica	..	..	25.0	.. ..	31.0
Oxide of Iron	..	..	0.5	.. ..	2.0
Sp. Gr. 4.5 to 4.7. H. 7.5.					

Primary form a rhomboidal octahedron, modified like the diamond, but all its angles set obliquely : colour, orange, sometimes white.

The test of relative hardness is a very important one for ascertaining the species of precious stones, on account of the facility of its application. Its principle is the fact that the native crystal of any species will scratch all in the scale below itself. Thus the Diamond, standing highest (10.) scratches all the rest. The following is the received scale: 9. Corundum: Sapphire, Ruby; 8. Brazilian Topaz; 7. Rock-crystal; 6. Adularia; 5. Asparagus-stone; 4. Fluor-Spar, &c.

The test of the relative specific gravity of the different species, a criterion upon which our modern mineralogists lay so much stress, and which they claim as a discovery of their own, was well known and resorted to by the Persian jewellers six centuries ago, and if then, doubtless at a much earlier date.

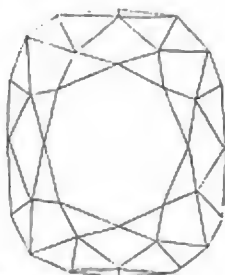
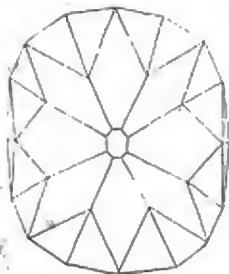
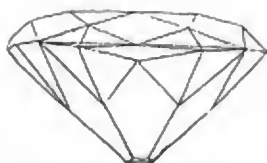
Ben Mansur's notice of this point is so curious as to demand its insertion at length:—"Of the relations of certain precious stones to others. *Abu Rihan* pretends to have discovered by experiment that one *misal* of the Blue Jacut stands in equal proportion with five *dank* and three *tissu* of the Red Jacut; with five *dank* and two and a half *tissu* of the Laal; with four *dank* minus one *tissu* of Coral;

and with four *dank* minus two *tissu* of the Onyx, or of the Crystal.

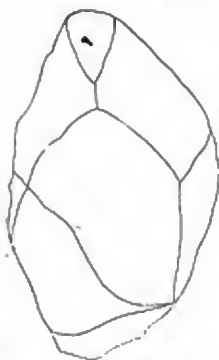
“The method used for the investigation of the weights and dimensions of gems is the following. They take a bowl filled with water, and throw the stones singly into the same. The quantity of water that through the immersion of each separate stone flows over the bowl occupies the space of the same. God knoweth best!”

Note.—The *dank* in Egypt = 3 carats, in Spain = 2. It is the quarter or the sixth of a drachm. The *tissu* = $\frac{1}{4}$, or 2 grains of barley. The *miscol* = $1\frac{1}{2}$ drachm.

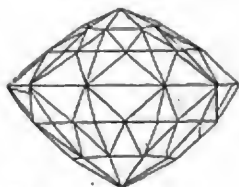
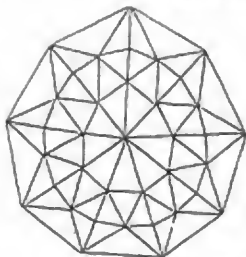




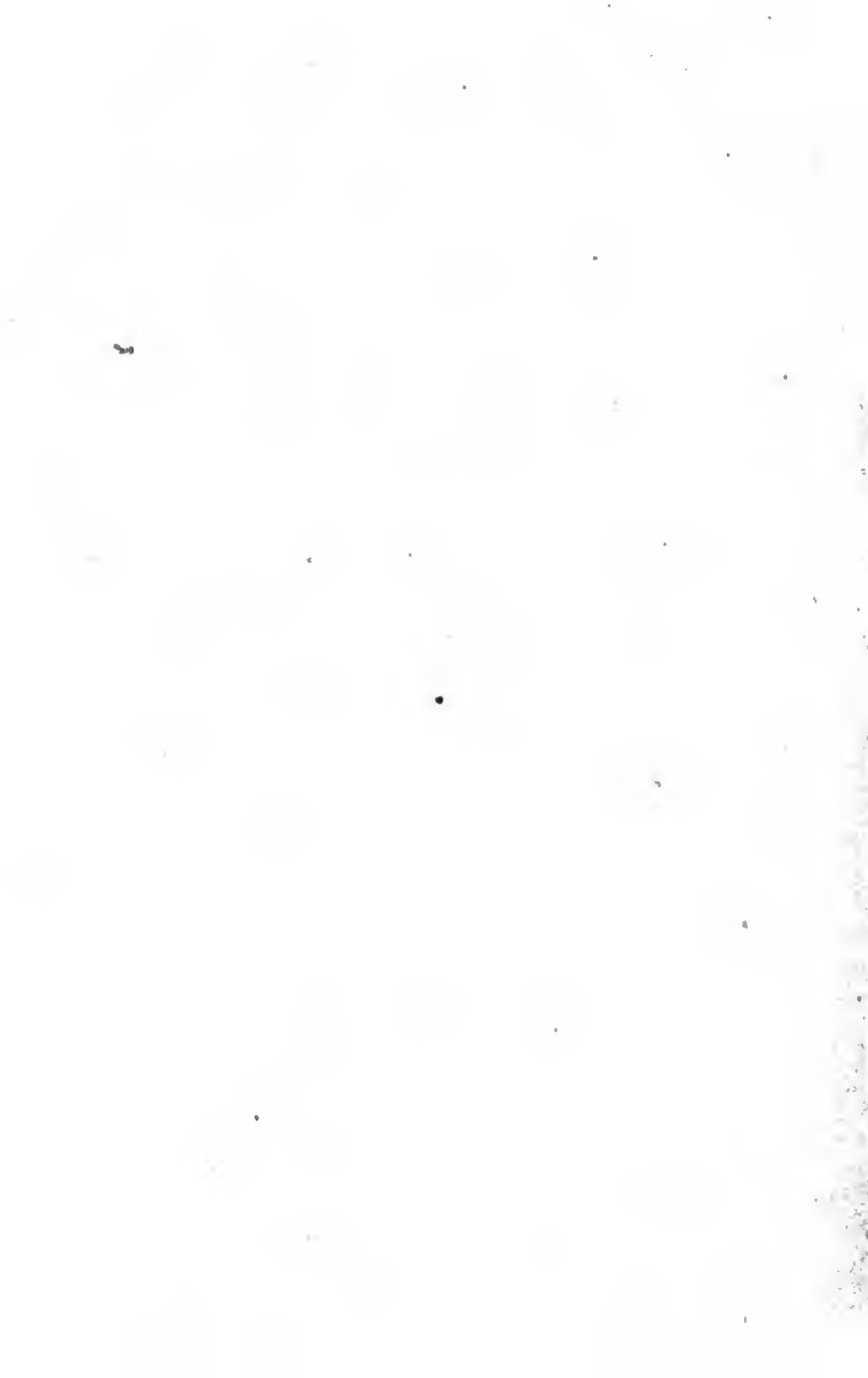
Star of the South, 125 c.



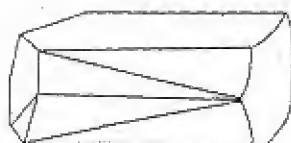
Star of the South, rough, 234½ c.



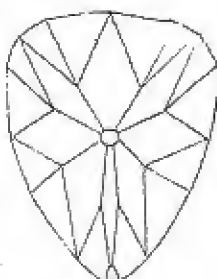
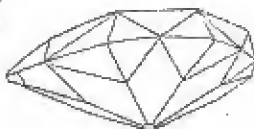
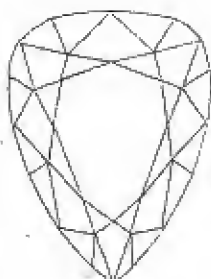
The Austrian, 139½ c.







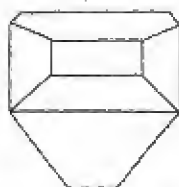
The Shub, 85 c.



Mr. Dresden's Diamond, 764 c.



The same, rough.



Early Table, 63 $\frac{3}{4}$ c. Cut at the mine, Coubar (1653).
bought by Tavernier.

TABLE OF THE WEIGHTS AND PATTERNS OF THE LARGEST KNOWN DIAMONDS AND OTHER PRECIOUS STONES.

"The King of Portugal's," as large as a hen's egg, pea-shaped, slightly concave on one side; colour, deep yellow, and suspected of being a Topaz, uncut; weight, 1380 car. (Mawe).

"The Rajah of Mattan's," found at Laudak in 1787, uncut, 267 car.

"The Nizam's," found at Golconda, uncut, 340 car.

"The Great Mogul's," found at Coulour; weight in the rough, 787½ car.; cut as a rose, 280 car.

"The Great Table," seen by Tavernier at Golcond in 1642; weight, 242½ car. It was on sale for 500,000 rupees, he had 400,000 for it in vain.

"The Regent," found at Puteal, in the rough, 410 car., cut as a brilliant, 136½ car.

"The Orloff," Indian-cut as a rose, 193 car. It has a faint yellow tinge.

"The Star of the South," found at the Bogageni mine, Brazil, by a negress (1863); in the rough, 254½ car.; cut as a brilliant, 124½ car. The stone has a decided tinge, some say of rose, others, of yellow.

"The Koh-i-noor," Indian-cut, but retaining nearly its native weight, 186½ car.; re-cut (1862) as a brilliant, 102½ car.

"The Grand Duke of Tuscany," sometimes named "The Austrian;" cut as a double-rose, 139½ car. Its colour is a decided yellow; and there is a tradition that the stone was bought for a trifle as a mere coloured crystal at a jeweller's in Florence.

"The Shah" (Russia), a long prism, retaining many of its native faces, 95 car. What greatly adds to its interest is a Persian inscription cut upon it. Bought of Chosroes, Abbas Mirza's youngest son.

"The Nassack" (the Marquis of Westminster's), captured from the Peishwah of the Mahrattas; Indian-cut, 89½ car., a pear-shaped stone, re-cut as a brilliant in London, 78½ car.

"The Pigott," 82½ car., was disposed of by lottery in London (1801) for 30,000*l.* The present owner is not known.

"Mr. Dresden's Diamond," from Brazil (1880), heart-shape], a shallow brilliant, 76½ car.

"The Empress Eugénie's," a brilliant, 51 car.

"The Pasha of Egypt's," a brilliant, 40 car.

"The Dutch," 36 car.

"Hope's Blue Diamond," suspected to be that of the French Regalia (stolen in 1792), and then weighing 67 car., and afterwards re-cut as a brilliant to its present weight of 44½ car. This was probably at its origin the stone "d'un beau violet," weighing in the rough 112½ car., but disadvantageously shaped, being flat and thin, brought from India by Tavernier, and sold to Louis XIV. in 1668.

"The Polar Star" (Princess Yassopouff), a brilliant, 40 car.

"The Treasury of Dresden's," emerald-green, 31½ car.

"Halphen's Rose-coloured," 22½ car.

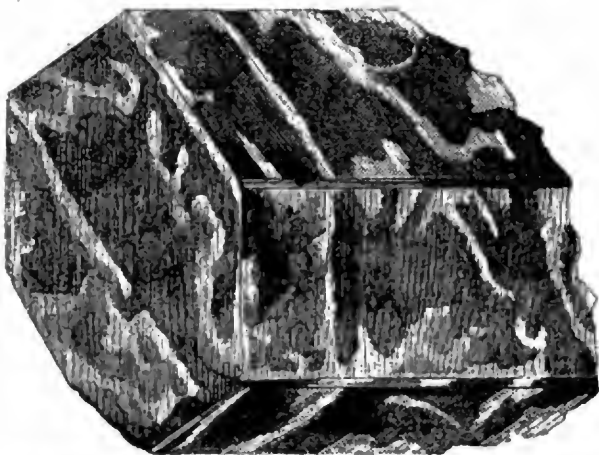
"Prince de la Riccia's," rose-coloured, 15 car.

"Paul I.'s," ruby-coloured, 10 car.

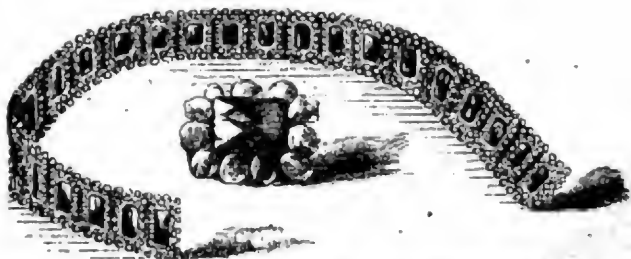
Mawe also mentions as belonging to the Portuguese crown two other diamonds, rough, of great beauty; the one weighing 215 carats, the other a little less. Both were found in the river Abaytè, to the east of the district of Minas Geraes, by three men banished into the interior. Besides these he notices two nearly perfect octahedrons, of 134 and 120 carats each. And to conclude, the state-waistcoat of Joseph I. had twenty buttons, each a single diamond worth 5000*l.*

The largest known Emerald is the Devonshire, two inches in diameter, and of the finest colour: not cut. It came from the Muzo mine, Santa Fé di Bogota, and was purchased by the Duke from Dom Pedro.

The largest Sapphire has got its name, "The Wooden-



The Devonshire Emerald, 8 oz. 18 dwts., found at Muro, near Santa Fé di Bogota :
purchased by the Duke from Dom Pedro.



Emerald-girdle of Indian-cut stones. The Persian Diamond, "Sea of Light."



spoon-seller's," from the occupation of the man who found it, in Bengal. It is also called the "Ruspoli" after a former owner. Lozenge-shaped, with six faces, $132\frac{1}{4}$ carats. It was bought by Perret, a Parisian jeweller, for 170,000 francs (6800*l.*). Now in the Musée de Minéralogie, which possesses another of rare beauty, measuring $2 \times 1\frac{1}{2}$ inches.

The largest Pearl in the world is beyond all rivalry the "Hope;" weighing 3 ounces, and 2 inches deep by $2\frac{1}{2}$ in circumference at the larger end. It is pear-shaped and of a dark opalized hue. It is mounted for a pendant in a crown-imperial of five vertical bars set with brilliants upon a lining of crimson enamel, with a gold border of emeralds, sapphires, and rubies.

The largest Cats-eye (also the "Hope") is hemispherical, $1\frac{1}{2}$ inches in diameter; and formerly was the great pride of the King of Candy, from whom it was captured in 1815. It has been celebrated for many ages, and appears to be the one mentioned by Ribeiro in his "History of Ceylon," as at that time (16th century) belonging to the Prince of Ura. It is mounted in massy pure gold, set with cabochon rubies in the Oriental manner.

The largest Ruby ever seen in Europe is that presented by Gustavus III. of Sweden to the Czarina, upon his visit to her in 1777. It is equal in bulk to a small hen's-egg, and is of fine colour. This was the size of Rudolf II.'s, already quoted, and therefore must weigh at least 100 carats. The highest weight of those seen in India by Tavernier did not exceed 50 carats. None in the French Regalia weighed above $8\frac{1}{4}$ carats.

FORMER AND PRESENT SELLING PRICES OF PRECIOUS STONES.

CELLINI (*Orificeria*) estimates the comparative values of the four species to which he restricts the honourable title of "Precious" as follows, for stones of the best quality :—

			Gold Scudl.
Ruby, of one carat weight	..	..	300
Emerald	..	..	400
Diamond	..	..	100
Sapphire	..	..	10

The gold scudo (8 to the ounce Roman) equals nine shillings in *intrinsic* value, and its *current* was at that date (1560) not much more in *Italy*, then the richest country in the world. This point, as regards the preceding century, has been satisfactorily established by Carli (*Zecche Italiane*).

In De Boot's age, the next generation, the jewellers valued the Ruby at half the price of a Diamond of the same *size* (not weight), but if it exceeded 10 carats, then by the same rule as he lays down for the latter stone. The Balais he fixes at 10 ducats for the first carat, afterwards to be multiplied by the simple weight; the Spinel at half the price of the Diamond, which last, for *table-cut*, he puts at 30 ducats (15*l.*). The Sapphire of one carat, at 2 thalers (6*s.*), for higher weights as their square multiplied by one thaler. The Emerald had then become so plentiful that he thinks quarter the value of the Diamond rather above than below the mark for its selling price.

Berquem values the Diamond, rose-cut, of one carat at 100 francs; Tavernier, some twenty years later, at 150. Neither mentions other patterns than the Rose and the Table. I should therefore accept with all distrust Caire's assertion that the "single-cut brilliant" (*brillant en seize*) was invented under Mazarin's auspices.

Dutens (published in 1777) puts the value of the Diamond *brilliant* of one carat at 8 louis d'or (the louis is worth 18*s.* intrinsically), and afterwards as the square of the weight multiplied by that figure. Small Emeralds, fine quality, at one louis the carat, taken together: of 1½ car. at 5 louis; of 2 car. at 10; after which weight no rule could be laid down as trustworthy. In his times the Sapphire was much depreciated, for he fixes the first carat at 12 *livres* (9*s.*) only, and thenceforward as the square multiplied by this. One of 10 car. he prices at 50 louis; of 20 car. at 200, and so on. Emeralds had fallen so low at the beginning of this century that Caire fixes the first carat at no more than 24 fr. A stone of 20 car. he values at 3000 fr. (120*l.*) only. For the Ruby, he puts the first carat at 10 louis; of 2 car., at 40; of 3, at 150; of 4, at 400. It is evident that then, as now, there was no fixed principle for valuing a fine Ruby exceeding 2 car. in weight.

In the present trade a Ruby (perfect) exceeding one carat sells far higher than a Diamond of equal weight. I have myself seen one of 3 carats, for which 300*l.* had recently been paid, and was informed, on the best authority, that one of yet finer colour, weighing 11 *grains*, had recently (this was in 1856) changed hands for 1100*l.*, that is, at the rate of 100*l.* per grain, or nearly at Cellini's estimation.

For many years antecedent to 1850, the Diamond remained fixed (with few fluctuations) at Jeffries' and Dutens' figure of 8*l.* the first carat. Emeralds and Sapphires were also equalized in value, which might be called 8*l.* the carat

for fine stones; the pale, of either species, having never any definite value in the trade. But since that date, whilst the Diamond has only doubled its value, the Sapphire is worth four times what it then sold for; and as for the Emerald, it has become the rarest of all gems, and when perfect exceeds the Diamond in the same proportion as Cellini fixes.

The Spinel and the Balais are usually put upon the same footing as the Sapphire; they are in little demand in Europe, though as highly prized as ever by the Orientals.

For the Pearl, De Boot gives the same set of tables as for the Opal, fixing 3 thalers (9s.) for the first carat, and then as the weight squared up to 11 car.; but for higher weights multiplying the square by 4 thalers. Jeffries, in 1750, lays down the same rule for the Pearl, but substitutes for the multiplier the astonishingly low figure of 8s., which, considering the difference in the value of money between the two dates, is less than the fourth of De Boot's estimation. The present selling price in Paris is given by Barbot as 50 fr. per carat, multiplied by the simple weight.

The Turquoise resembles the Diamond in the rapidity with which its value mounts up as the magnitude of the stone increases. The smallest, those of the size of a millet-seed, used for incrusting jewelry, sell for no more than sixpence the dozen; whereas a good one half an inch in diameter, is worth 10*l.*; and Emanuel mentions one as large as a shilling recently sold for 400*l.*!

It is impossible to fix the selling price of the Jacinth, Chrysolite, Brazilian Topaz, Amethyst, or indeed of any gem that has gone out of fashion. Such things the dealers buy at mere nominal prices, charging for them, when set, according to their *conscience*. To give an idea of this depreciation, Barbot states 100 fr. (4*l.*) as the highest limit per kilo. (2 lbs.) for Brazilian Topazes in the rough. And yet

in the last century this was a valuable stone, Dutens pricing it by the square of the weight multiplied by 5*s.*, or at a third of that of the Oriental. Again, the Chrysoprase, which then fetched 10*l.* to 20*l.* as a ring-stone, may now be bought for a few shillings merely as a specimen for the cabinet.

Lapis-lazuli, the fine Persian, sells in the mass at 30*l.* per pound. It is sawn into slabs for brooches and pendants, an antique fashion recently revived. The inferior pieces used formerly to be calcined for ultramarine, but have been superseded by the cheaper prepared cobalt.



DESCRIPTION OF THE TAIL-PIECES.

ALL DRAWN TO DOUBLE THE ACTUAL SIZE.

Title-page. Serapis, lord of the subterranean world and its treasures. Assuming here the added characters of Ammon and Phœbus, all three deities being understood by the later theosophists as mere personifications of the Solar Genius. Sapphirine Calcedony, the *Jaspis ærëusa*, chosen as a material appropriate to the subject. The legend is the dedicatory inscription upon an altar to the same god in the Villa Albani.

Page x. Philosopher studying under the inspiration of a terminal bust of Socrates. Sard.

Page 38. Democritus, the first mineralogist. Sardoina.

Page 118. Parakeet carrying a bunch of nuts. This was the only species known to the ancients, the "*psittacus torquatus*" of Central India, and the "*psittacus Alexandri*" of Ceylon. It is bright-green, with a red ring, *torques*, about the neck, and two long reflexed tail-feathers, exactly as described by Apuleius in his 'Florida.' Sard.

Page 138. Minerva wearing an Athenian helmet: an imitation of the pure Greek style by the Neapolitan artist Rega, the greatest of the modern school. Aqua-marine.

Page 169. Enormous Corinthian crater, of embossed metal, belonging to the Phrygian (Bacchio) Mysteries; symbols of which are the shepherd's-crook and pipes laid at its base. Red Jasper.

Page 224. Rural scene, bull and goats under a tree; a

simple yet pleasing composition in the later Greek style. Sard, found at Athens.

Page 241. Gallienus and Salonina, *regardant* busts: between them the conjugal myrtle-twined altar, supporting the Roman eagle holding forth the laurel-crown of victory. The last symbol, coupled with the *wheat-ears* springing out of the imperial pair, leave no doubt that this unique design commemorates the recovery of Africa from the usurper Celsus, by the Emperor's cousin Galliena; on which occasion we know an aureus was coined in *her* name, GALLIENAE AVGVSTAE, with the head of Gallienus, similarly wheat-crowned. Sard.

Page 257. The supposed signet and portrait of Matthew Paris, wearing the Benedictine cowl; but more probably an attempt at a Madonna in the common Italian head-dress, by some Florentine engraver of the fourteenth century. Sapphire.

Page 275. Sapor II., borne up on quadruple wings, like an ancient Babylonian god: in the field the Sun and Moon. Legend, "Piruz Shahpuhri," "Sapor the Victorious." Almandine.

Page 325. Cleopatra as the "New Isis," the ibis perched on her hand: above, the heads of the Sun and Moon, titles given by her to her twin-sons, Ptolemy and Alexander. Sard.

Page 340. Chosroes II., "Khosru Parviz" in his full royal attire: the two ends of the diadem float away from under his pearl-bordered cap. The legend in the latest Pehlevi letter (or rather Cuphic) reads "Ap (zud) Aumar" "Long live Omar;" and we know the Arab Caliphs struck no money of their own for seventy years after the conquest, but continued to coin that with the type of Chosroes (exactly as on this gem), merely adding their own names on the *outer* margin of the piece.

Page 346. Bust of a young lady of the times of Severus. The legend AMO TEEGO sufficiently bespeaks the original destination of the gem; an exceptionally good engraving for that period. Sard.

Page 353. Melpomene, or Minerva Victrix, holding a palm-branch and seated upon a pile of armour. She is apostrophizing a mask of the Horned Bacchus, patron-god of the drama, whilst the "thymele," or theatrical altar, blazes before her; adjuncts all pointing out the gem as the signet of some eminent tragedian. Sard.

Page 356. Mole-cricket, carrying a cornucopia, whence issue Capricorn and a bee. These three emblems of Earth, Water, and Air, combine in this talisman to produce the *fecundity* expressed by the wheat-sheaf in the claw of the insect-porter. Sardoiné.

Page 364. Medusa, in the grandest Greek manner. Peridot.



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